

Glossary

accessible—Pertaining to physical access to areas and activities for people of different abilities, especially those with physical impairments.

adaptive resource management—The rigorous application of management, research, and monitoring to gain information and experience necessary to assess and modify management activities. It is a process that uses feedback from research, monitoring, and evaluation of management actions to support or modify objectives and strategies at all planning levels. It is also a process in which policy decisions are implemented within a framework of scientifically driven experiments to test predictions and assumptions inherent in management plans. Analysis of results helps managers determine whether current management should continue as is or whether it should be modified to achieve desired conditions.

adfluvial—Dwelling in both rivers and lakes.

Administration Act—National Wildlife Refuge System Administration Act of 1966.

alluvial fan—A sedimentary deposit where a fast-flowing stream has flown into a flatter plain.

alternative—A reasonable way to solve an identified problem or satisfy the stated need (40 CFR 1500.2); one of several different means of accomplishing refuge purposes and goals and contributing to the Refuge System mission (Draft Service Manual 602 FW 1.5).

amphibian—A class of cold-blooded vertebrates that includes frogs, toads, and salamanders.

annual—A plant that flowers and dies within 1 year of germination.

baseline—A set of critical observations, data, or information used for comparison or a control.

biological control—The use of organisms or viruses to control invasive plants or other pests.

biological diversity, also biodiversity—The variety of life and its processes, including the variety of living organisms, the genetic differences among them, and the communities and ecosystems in which they occur (Fish and Wildlife Service Manual 052 FW 1.12B). The National Wildlife Refuge System's focus is on indigenous species, biotic communities, and ecological processes.

biological integrity—Biotic composition, structure, and functioning at genetic, organism, and community

levels comparable with historic conditions, including the natural biological processes that shape genomes, organisms, and communities.

biotic—Pertaining to life or living organisms; caused, produced by, or comprising living organisms.

blowout—An area denuded of vegetation due to rapid wind erosion.

calcareous—Consisting of or containing calcium carbonate.

canopy—A layer of foliage, generally the uppermost layer, in a vegetative stand; midlevel or understory vegetation in multilayered stands. Canopy closure (also canopy cover) is an estimate of the amount of overhead vegetative cover.

CCP—*See* comprehensive conservation plan.

CFR—*See* Code of Federal Regulations.

cfs—Cubic feet per second.

clonal—A group of genetically identical individuals (e. g., plants, fungi, or bacteria) that have grown in a given location, all originating vegetatively (not sexually) from a single ancestor.

Code of Federal Regulations (CFR)—The codification of the general and permanent rules published in the *Federal Register* by the executive departments and agencies of the federal government. Each volume of the CFR is updated once a calendar year.

compatibility determination—*See* compatible use.

compatible use—A wildlife-dependent recreational use or any other use of a refuge that, in the sound professional judgment of the director of the U.S. Fish and Wildlife Service, will not materially interfere with or detract from the fulfillment of the mission of the Refuge System or the purposes of the refuge (Draft Service Manual 603 FW 3.6). A compatibility determination supports the selection of compatible uses and identified stipulations or limits necessary to ensure compatibility.

comprehensive conservation plan (CCP)—A document that describes the desired future conditions of the refuge and provides long-range guidance and management direction for the refuge manager to accomplish the purposes of the refuge, contribute to the mission of the Refuge System, and to meet other relevant mandates (Draft Service Manual 602 FW 1.5).

concern—*See* issue.

contiguous—An area whose boundaries touch.

cool-season grasses—Grasses that begin growth earlier in the season and often become dormant in the summer. These grasses will germinate at lower temperatures. Examples of cool-season grasses at the refuge are western wheatgrass, needle and thread, and green needlegrass.

cover, also cover type, canopy cover—Present vegetation of an area.

cultural resources—The remains of sites, structures, or objects used by people in the past.

depredation—Destruction or consumption of eggs, broods, or individual wildlife due to a predatory animal; damage inflicted on agricultural crops or ornamental plants by wildlife.

drawdown—The act of manipulating water levels in an impoundment to allow for the natural drying-out cycle of a wetland.

EA—*See* environmental assessment.

ecosystem—A dynamic and interrelating complex of plant and animal communities and their associated nonliving environment; a biological community, together with its environment, functioning as a unit. For administrative purposes, the U.S. Fish and Wildlife Service has designated fifty-three ecosystems covering the United States and its possessions. These ecosystems generally correspond with watershed boundaries, and their sizes and ecological complexity vary.

ecotone—The transition zone between two different plant communities, as that between forest and prairie.

ecotype—A subspecies or race that is especially adapted to a particular set of environmental conditions.

EIS—Environmental impact statement.

emergent—A plant rooted in shallow water and having most of the vegetative growth above water such as cattail and hardstem bulrush.

endangered species, federal—A plant or animal species listed under the Endangered Species Act of 1973, as amended, that is in danger of extinction throughout all or a significant portion of its range.

endangered species, state—A plant or animal species in danger of becoming extinct or extirpated in a particular state within the near future if factors contributing to its decline continue. Populations of these species are at critically low levels or their habitats have been degraded or depleted to a significant degree.

endemic species—Plants or animals that occur naturally in a certain region and whose distribution is relatively limited to a particular locality.

endogenous—growing or developing from within; originating within. Endogenous fat reserves are used for energy during periods of fasting.

environmental assessment (EA)—A concise public document, prepared in compliance with the National Environmental Policy Act, that briefly discusses the purpose and need for an action and alternatives to such action, and provides sufficient evidence and analysis of impacts to determine whether to prepare an environmental impact statement or finding of no significant impact (40 CFR 1508.9).

environmental health—Composition, structure, and functioning of soil, water, air, and other abiotic features comparable with historic conditions, including the natural abiotic processes that shape the environment.

eutrophication—Characterized by an abundant accumulation of nutrients that support a dense growth of algae and other organisms, the decay of which depletes the shallow waters of oxygen in summer.

extinction—The complete disappearance of a species from the earth; no longer existing.

extirpation—The extinction of a population; complete eradication of a species within a specified area.

fauna—All the vertebrate and invertebrate animals of an area.

federal trust resource—A trust is something managed by one entity for another who holds the ownership. The Service holds in trust many natural resources for the people of the United States of America as a result of federal acts and treaties. Examples are species listed under the Endangered Species Act, migratory birds protected by international treaties, and native plant or wildlife species found on a national wildlife refuge.

federal trust species—All species where the federal government has primary jurisdiction including federally endangered or threatened species, migratory birds, anadromous fish, and certain marine mammals.

fen—An area of low, flat, marshy land. A fen is fed by surface or ground water and is neutral or alkaline in acidity.

flora—All the plant species of an area.

fluvial—Dwells in rivers or streams.

forb—A broad-leaved herbaceous plant; a seed-producing annual, biennial, or perennial plant that does not develop persistent woody tissue but dies down at the end of the growing season.

fragmentation—The alteration of a large block of habitat that creates isolated patches of the original habitat that are interspersed with a variety of other habitat types; the process of reducing the size and connectivity of habitat patches, making movement of individuals or genetic information between parcels difficult or impossible.

geographic information system—A system that captures, stores, analyzes, and presents locational information.

gleyed soil—Soil that is greenish-gray in color and oxygen-deprived due to high water content.

GIS—*See* geographic information system.

goal—Descriptive, open-ended, and often broad statement of desired future conditions that conveys a purpose but does not define measurable units (Draft Service Manual 620 FW 1.5).

graminoid—Grasses (family *Gramineae* or *Poaceae*) and grasslike plants such as sedges (family *Cyperaceae*) and rushes (family *Juncaceae*).

grassland tract—A contiguous area of grassland without fragmentation.

GS—general schedule (pay rate schedule for certain federal positions).

habitat—Suite of existing environmental conditions required by an organism for survival and reproduction; the place where an organism typically lives and grows.

habitat type, also vegetation type, cover type—A land classification system based on the concept of distinct plant associations.

herbivory—Consumption of vegetation by herbivores; a type of predation.

hummocky—A fertile, wooded area that is slightly elevated from surrounding marshes or swamps.

hypereutrophic—Very nutrient-rich lakes characterized by frequent and severe nuisance algal blooms and low transparency. Hypereutrophic lakes are the most biologically productive lakes, and support large amounts of plants, fish, and other animals. Hypereutrophic lakes have a visibility depth of <3 feet, they have >40 micrograms/liter total chlorophyll and >100 micrograms/liter phosphorus.

Improvement Act—National Wildlife Refuge System Improvement Act of 1997.

indigenous—Originating or occurring naturally in a particular place.

integrated pest management—Methods of managing undesirable species such as invasive plants. Education, prevention, physical or mechanical methods of control, biological control, responsible chemical use, and cultural methods are methods of controlling pests.

introduced species—A species present in an area due to intentional or unintentional escape, release, dissemination, or placement into an ecosystem as a result of human activity.

invasive plant—A species that is nonnative to the ecosystem under consideration and whose introduction

causes, or is likely to cause, economic or environmental harm or harm to human health.

irruptive—not a regular cycle. Species which exhibit irruptive growth are characterized by sharp peaks in population followed by sharp declines. They do not reach a carrying capacity.

issue—Any unsettled matter that requires a management decision; for example, a Service initiative, opportunity, resource management problem, a threat to the resources of the unit, incompatibility of uses, public concern, or the presence of an undesirable resource condition (Draft Service Manual 602 FW 1.5).

lacustrine—Dwells in a lake.

lek—A dancing ground for male sage grouse used to attract breeding females.

macroinvertebrate—An organism that has no backbone, an invertebrate, and is visible without magnification.

management alternative—*See* alternative.

mesic—Of, characterized by, or adapted to a moderately moist habitat.

mesotrophic—Commonly, clear water lakes and ponds with beds of submerged aquatic plants and medium levels of nutrients.

migration—Regular extensive, seasonal movements of birds between their breeding regions and their wintering regions; to pass usually periodically from one region or climate to another for feeding or breeding.

migratory birds—Birds which follow a seasonal movement from their breeding grounds to their wintering grounds. Waterfowl, shorebirds, raptors, and songbirds are all migratory birds.

mission—Succinct statement of purpose and/or reason for being.

mitigation—Measure designed to counteract an environmental impact or to make an impact less severe.

monitoring—The process of collecting information to track changes of selected parameters over time.

montane wetland—the zone directly below the subalpine zone which usually has cooler temperatures and higher rainfall than lower altitude wetlands. The highest zone is alpine, followed by subalpine, then montane, then the foothill zone. Montane wetlands are a type of high-elevation wetland.

national wildlife refuge—A designated area of land, water, or an interest in land or water within the National Wildlife Refuge System, but does not include coordination areas; a complete listing of all units of the Refuge System is in the current “Annual Report

of Lands Under Control of the U.S. Fish and Wildlife Service.”

National Wildlife Refuge System (Refuge System)—Various categories of areas administered by the Secretary of the Interior for the conservation of fish and wildlife, including species threatened with extinction; all lands, waters, and interests therein administered by the Secretary as wildlife refuges; areas for the protection and conservation of fish and wildlife that are threatened with extinction; wildlife ranges; game ranges; wildlife management areas; and waterfowl production areas.

National Wildlife Refuge System Improvement Act of 1997 (Improvement Act)—Sets the mission and the administrative policy for all refuges in the National Wildlife Refuge System; defines a unifying mission for the Refuge System; establishes the legitimacy and appropriateness of the six priority public uses (hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation); establishes a formal process for determining appropriateness and compatibility; establish the responsibilities of the Secretary of the Interior for managing and protecting the Refuge System; requires a comprehensive conservation plan for each refuge by the year 2012. This Act amended portions of the Refuge Recreation Act and National Wildlife Refuge System Administration Act of 1966.

native species—A species that, other than as a result of an introduction, historically occurred or currently occurs in that ecosystem.

natural processes—a process existing in or produced by nature (rather than by the intent of humans.)

Neotropical migrant—A bird species that breeds north of the United States and Mexican border and winters primarily south of this border.

nest success—The chance that a nest will hatch at least one egg.

nongovernmental organization (NGO)—Any group that is not composed of federal, state, tribal, county, city, town, local, or other governmental entities.

noxious weed—Any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, natural resources of the United States, public health, or the environment.

objective—An objective is a concise target statement of what will be achieved, how much will be achieved, when and where it will be achieved, and who is responsible for the work; derived from goals and provides the basis for determining management strategies. Objectives should be attainable and time-specific and should be stated quantitatively to the extent possible. If objectives cannot be stated

quantitatively, they may be stated qualitatively (Draft Service Manual 602 FW 1.5).

obligates—Species which must occupy a certain niche or behave in a certain way in order to survive.

oligotrophic—(of a lake) characterized by a low accumulation of dissolved nutrient salts, supporting but a sparse growth of algae and other organisms, and having a high oxygen content owing to the low organic content.

palustrine—Relating to a system of inland, nontidal wetlands characterized by the presence of trees, shrubs, and emergent vegetation (vegetation that is rooted below water but grows above the surface). Palustrine wetlands range from permanently saturated or flooded land, to land that is wet only seasonally.

patch—An area distinct from that around it; an area distinguished from its surroundings by environmental conditions.

pelagic—Open water.

perennial—Lasting or active through the year or through many years; a plant species that has a life span of more than 2 years.

permanent seasonal employee—*See* temporary seasonal employee. A permanent position with benefits, 40 hours per week during the season of employment, usually summer.

persistent emergent vegetation—An emergent plant is one which grows in water but is partly above the surface of the water. Persistent emergent vegetation are plants whose stems remain standing through the winter until the next growing season, e.g. cattails and bulrushes.

plant community—An assemblage of plant species unique in its composition; occurs in particular locations under particular influences; a reflection or integration of the environmental influences on the site such as soil, temperature, elevation, solar radiation, slope, aspect, and rainfall; denotes a general kind of climax plant community, such as ponderosa pine or bunchgrass.

pluvial lake—A lake that experiences significant increase in depth and extent as a result of increased precipitation and reduced evaporation.

prescribed fire—The skillful application of fire to natural fuels under conditions such as weather, fuel moisture, and soil moisture that allow confinement of the fire to a predetermined area and produces the intensity of heat and rate of spread to accomplish planned benefits to one or more objectives of habitat management, wildlife management, or hazard reduction.

priority public use—One of six uses authorized by the National Wildlife Refuge System Improvement Act of 1997 to have priority if found to be compatible

with a refuge's purposes. This includes hunting, fishing, wildlife observation, wildlife photography, environmental education, and interpretation.

proposed action—The alternative proposed to best achieve the purpose, vision, and goals of a refuge; contributes to the Refuge System mission, addresses the significant issues, and is consistent with principles of sound fish and wildlife management.

public—Individuals, organizations, and groups; officials of federal, state, and local government agencies; Indian tribes; and foreign nations. It may include anyone outside the core planning team. It includes those who may or may not have indicated an interest in Service issues and those who do or do not realize that Service decisions may affect them.

public involvement or scoping—A process that offers affected and interested individuals and organizations an opportunity to become informed about, and to express their opinions on, Service actions and policies. In the process, these views are studied thoroughly, and thoughtful consideration of public views is given in shaping decisions for refuge management.

purpose of the refuge—The purpose of a refuge is specified in or derived from the law, proclamation, executive order, agreement, public land order, donation document, or administrative memorandum establishing authorization or expanding a refuge, refuge unit, or refuge subunit (Draft Service Manual 602 FW 1.5).

raptor—A carnivorous bird such as a hawk, falcon, or vulture that feeds wholly or chiefly on meat taken by hunting or on carrion (dead carcasses).

refuge purpose—*See* purpose of the refuge.

Refuge System—*See* National Wildlife Refuge System.

refuge use—Any activity on a refuge, except administrative or law enforcement activity, carried out by or under the direction of an authorized Service employee.

resident species—A species inhabiting a given locality throughout the year; nonmigratory species.

rest—Free from biological, mechanical, or chemical manipulation, in reference to refuge lands.

restoration—Management emphasis designed to move ecosystems to desired conditions and processes, such as healthy upland habitats and aquatic systems.

rhizomatous plant—plant that uses rhizomes to reproduce and spread.

rhizome—a rootlike subterranean stem, commonly horizontal in position, that usually produces roots below and sends up shoots progressively from the upper surface.

riparian corridor—An area or habitat that is transitional from terrestrial to aquatic ecosystems

including streams, lakes, wet areas, and adjacent plant communities and their associated soils that have free water at or near the surface; an area whose components are directly or indirectly attributed to the influence of water; of or relating to a river; specifically applied to ecology, “riparian” describes the land immediately adjoining and directly influenced by streams. For example, riparian vegetation includes all plant life growing on the land adjoining a stream and directly influenced by the stream.

scoping—The process of obtaining information from the public for input into the planning process.

sediment—Material deposited by water, wind, and glaciers.

senior water users—water users with a water right that was filed earlier than the Service's.

seral—The series of relatively transitory plant communities that develop during ecological succession from bare ground to climax species.

Service—*See* U.S. Fish and Wildlife Service.

shorebird—Any of a suborder (*Charadrii*) of birds, such as a plover or snipe, that frequent the seashore or mud flat areas.

sodic—Soil containing sodium.

spatial—Relating to, occupying, or having the character of space.

special use permit—A permit for special authorization from the refuge manager required for any refuge service, facility, privilege, or product of the soil provided at refuge expense and not usually available to the general public through authorizations in Title 50 CFR or other public regulations (Refuge Manual 5 RM 17.6).

step-down management plan—A plan that provides the details necessary to carry out management strategies identified in the comprehensive conservation plan (Draft Service Manual 602 FW 1.5).

strategy—A specific action, tool, or technique or combination of actions, tools, and techniques used to meet unit objectives (Draft Service Manual 602 FW 1.5).

subirrigated—Also known as seepage irrigation, where water is delivered to the root from below the soil surface.

temporal—Of or relating to time.

temporary seasonal employee—*See* permanent seasonal employee. A temporary position without benefits, 40 hours per week during the season of employment, usually summer. The position will be reopened for candidates each year.

threatened species, federal—Species listed under the Endangered Species Act of 1973, as amended, that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.

threatened species, state—A plant or animal species likely to become endangered in a particular state within the near future if factors contributing to population decline or habitat degradation or loss continue.

trust resource—*See* federal trust resource.

trust species—*See* federal trust species.

U.S. Fish and Wildlife Service (Service, USFWS, FWS)—The principal federal agency responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people. The Service manages the 93 million acre National Wildlife Refuge System comprised of more than 530 national wildlife refuges and thousands of waterfowl production areas. It also operates sixty-five national fish hatcheries and seventy-eight ecological service field stations. The agency enforces federal wildlife laws, manages migratory bird populations, restores national significant fisheries, conserves and restores wildlife habitat such as wetlands, administers the Endangered Species Act, and helps foreign governments with their conservation efforts. It also oversees the federal aid program that distributes millions of dollars in excise taxes on fishing and hunting equipment to state wildlife agencies.

USFWS—*See* U.S. Fish and Wildlife Service.

U.S. Geological Survey (USGS)—A federal agency whose mission is to provide reliable scientific information to describe and understand the earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect our quality of life.

USGS—*See* U.S. Geological Survey.

ungulate—a hoofed mammal.

vegetation alliance—A physiognomically (pertaining to physical features, character, or appearance) uniform group of vegetation associations sharing one or more diagnostic (dominant, differential, indicator, or character) species that, as a rule, are found in the uppermost stratum of the vegetation. This is the second finest level in the National Vegetation Classification Standard hierarchy.

vision statement—A concise statement of the desired future condition of the planning unit, based primarily on the Refuge System mission, specific refuge purposes, and other relevant mandates (Draft Service Manual 602 FW 1.5).

visual obstruction—Pertaining to the density of a plant community; the height of vegetation that blocks the view of predators and conspecifics to a nest.

visual obstruction reading (VOR)—A method of visually quantifying vegetative structure and composition.

VOR—*See* visual obstruction reading.

wading birds—Birds having long legs that enable them to wade in shallow water; includes egrets, great blue herons, black-crowned night-herons, and bitterns.

waterbird—Birds dependent upon aquatic habitats to complete portions of their life cycles (for example, breeding).

waterfowl—A category of birds that includes ducks, geese, and swans.

watershed—The region draining into a river, a river system, or a body of water.

wetland management district (WMD)—Land that the Refuge System acquires with Federal Duck Stamp money for restoration and management, primarily as prairie wetland habitat critical to waterfowl and other wetland birds.

WG—wage grade schedule (pay rate schedule for certain federal positions).

wildland fire—A free-burning fire requiring a suppression response; all fire other than prescribed fire that occurs on wildlands (Service Manual 621 FW 1.7).

wildlife-dependent recreational use—Use of a refuge involving hunting, fishing, wildlife observation, wildlife photography, environmental education, or interpretation. The National Wildlife Refuge System Improvement Act of 1997 specifies that these are the six priority public uses of the Refuge System.

WMD—*See* wetland management district.

woodland—Open stands of trees with crowns not usually touching, generally forming 25%–60% cover.

WPA—Works Progress Administration or Waterfowl Production Area.

WUI—wildland–urban interface.

Appendix A

Public Involvement

A notice of intent (NOI) to prepare the draft comprehensive conservation plan (CCP) and environmental assessment (EA) was published in the *Federal Register* on June 12, 2006. A mailing list of more than 250 names was compiled during preplanning; the list includes private citizens; local, regional, and state government representatives and legislators; other federal agencies; and interested organizations. Public scoping began immediately after publication of the NOI and was announced through news releases and issuance of the first planning update in July 2006. Information was provided on the history of the refuge and the CCP process, along with an invitation to public scoping meetings. These meetings were also announced through the local and statewide media. Each planning update included a comment form as a tool for the public to provide written comments. Any form of written comments were accepted, including emails to the refuge's email address, redrocks@fws.gov.

Three public scoping meetings were held within a 2-hour drive of the refuge office. There were over thirty-five attendees, primarily local citizens and surrounding ranchers. Following a presentation about the refuge and an overview of the CCP and NEPA processes, attendees were encouraged to ask questions and offer comments. Verbal comments were recorded and each attendee was given a comment form to submit additional thoughts or questions in writing.

All written comments were due by September 15, 2006. A total of fifty-five additional written comments were received throughout the scoping process. All comments were shared with the planning team and considered throughout the planning process.

The draft CCP and EA were released to the public on September 26, 2008 through a notice of availability published in the *Federal Register*. Copies of the draft CCP and EA and/or a planning update were mailed to individuals on the planning mailing list. Initially the public was offered a 30-day review period. Numerous requests from the public and state representatives resulted in an additional 30 days being granted, for a full 60-day review. All comments needed to be received or postmarked by November 26, 2008. Two public meetings were held first on October 8, 2008 in Lima, Montana and again on October 9, 2008 in Dillon, Montana. These

meetings were announced in the planning update and through the local and statewide media. Over thirty individuals participated in these meetings. A short presentation was given on the draft CCP followed by an opportunity for participants to offer comments.

In addition to these public meetings, the planning team received over 100 additional written comments during the public review process. The planning team reviewed all comments received both individually and as a team. Several modifications were made to this final document based on this public review. Responses to substantive comments are summarized in this appendix.

FEDERAL OFFICIALS

U.S. Representative Dennis Rehberg,
Washington DC
Representative Rehberg State Office, Missoula, MT
U.S. Senator Max Baucus, Washington DC
Sen. Baucus's Area Director, Bozeman, MT
U.S. Senator John Tester, Washington DC
Sen. Tester's Area Director, Bozeman, MT

FEDERAL AGENCIES

National Forest Service, Dillon, MT
National Forest Service, Ennis, MT
Bureau of Land Management, Dillon, MT
National Park Service, Yellowstone National Park,
MT and Omaha, NE
Bureau of Reclamation, Dillon, MT
Agricultural Research Service, Dubois, ID
U.S. Geological Service, Fort Collins Science Center,
Fort Collins, CO
U.S. Geological Service, Bozeman, MT

TRIBAL OFFICIALS

Eastern Shoshone Business Council, Ft. Washakie,
WY
Crow Tribe of Indians, Crow Agency, MT
Northern Cheyenne Tribal Council, Lame Deer, MT
Arapaho Business Council, Fort Washakie, WY
Nez Pierce, Lapwai, ID
Confederated Salish and Kootenai, Pablo, MT
Shoshone-Bannock, Fort Hall, ID
Blackfoot Nation, Browning, MT

STATE OFFICIALS

Governor Brian Schweitzer, Helena, MT
Mary Sexton, Office of the Governor, Helena, MT
Representative Diane Rice, Harrison, MT
Representative Bill Tash, Dillon, MT
Representative Debbie Barrett, Dillon, MT
Representative Roger Koopman, Bozeman, MT
Representative John Sinrud, Bozeman, MT
Representative Jack Wells, Bozeman, MT
Senator Gary Perry, Manhattan, MT
Senator Steve Gallus, Butte, MT
Senator Joe Balyeat, Bozeman, MT

STATE AGENCIES

Montana Department of State Lands, Dillon, MT
Montana Fish, Wildlife and Parks, Bozeman, MT
Montana Fish, Wildlife and Parks, West Yellowstone, MT
Montana Fish, Wildlife and Parks, Dillon, MT
Montana Fish, Wildlife and Parks, Sheridan, MT
Montana Fish, Wildlife and Parks, Helena, MT
Montana Department of Environmental Quality, Helena, MT
Harriman State Park, Island Park, ID
Idaho Department of Fish and Game, Boise, ID
Montana Department of Natural Resources and Conservation, Dillon, MT
Montana Historical Society and Preservation Office, Helena, MT

LOCAL GOVERNMENT

Madison County Commissioners, Madison, MT
Gallatin County Commissioners, Belgrade, MT
Beaverhead County Commissioners, Dillon, MT
Beaverhead County Road Department, Dillon, MT
Beaverhead County Weed Coordinator, Dillon, MT
Beaverhead County Planner, Dillon, MT

ORGANIZATIONS

Conservation Endowment Fund, Lima, MT
Greater Yellowstone Coalition, Bozeman, MT
Gallatin Wildlife Association, Bozeman, MT
Centennial Valley Association, Idaho Falls, ID
Henry's Lake Foundation, Island Park, ID
Montana Wildlife Federation, Helena, MT
Montana Audubon, Helena, MT
Greater Yellowstone Coordinating Committee, Bozeman, MT
Wilderness Watch, Missoula, MT
American Wildlands, Missoula, MT and Bozeman, MT
Ducks Unlimited, Memphis, TN and Lincoln, MT

Pintler Audubon Society, Dillon, MT
Wildlife Conservation Society, Bozeman, MT
Defenders of Wildlife, Bozeman and Missoula, MT and Washington DC
Trumpeter Swan Society, Wayan, ID
Sierra Club, San Francisco, CA and Bozeman, MT
The Nature Conservancy, Bozeman, MT
Rocky Mountain Elk Foundation, Missoula, MT
Trout Unlimited, Missoula, MT
Montana Wilderness Association, Dillon, MT
National Wildlife Refuge Association, Washington DC
The Wilderness Society, Washington D.C. and Bozeman, MT
Audubon Society, Washington DC and New York, NY
North American Nature Photography Association, Wheat Ridge, CO
National Wildlife Federation, Reston, VA
National Trappers Association, New Martinsville, WV
Isaac Walton League, Gaithersburg, MD
American Bird Conservancy, The Plains, VA
U.S. Humane Society, Washington DC

UNIVERSITIES, COLLEGES, AND SCHOOLS

Montana Tech, Butte, MT
University of Montana—Western, Dillon, MT
Montana State University, Bozeman, MT

MEDIA

Dillon Tribune, Dillon, MT
Montana Standard, Butte, MT
Bozeman Daily Chronicle, Bozeman, MT
West Yellowstone News, West Yellowstone, MT
KDBM Radio, Dillon, MT
KBOW and KOPR Radio, Butte, MT
KWYS and KEZQ Radio, Idaho Falls, ID
The Missoulian, Missoula, MT
KID Radio, Idaho Falls, ID
KUPI Radio and Sandhills Media, Idaho Falls, ID
The Post Register, Idaho Falls, ID
Rexburg Standard Journal, Rexburg, ID
Idaho State Journal, Pocatello, ID
Dillonite Daily, Dillon, MT

INDIVIDUALS

78 private individuals

PUBLIC COMMENTS

TRUMPETER SWANS

Comment 1: *The current draft appears to seriously downplay the purpose for which the refuge was established in 1935, i.e., to protect the trumpeter swan, and does not address the apparent recent decline in the refuge's population.*

Response 1: The Service is fully aware and supportive of the importance of this refuge to recovery and continued support of trumpeter swans. The trumpeter swan was a catalyst for establishing the refuge along with the abundance of waterfowl that used this complex of wetlands. The draft document did not ignore swan management. They were mentioned throughout the document over fifty times. Nevertheless the writers have included additional information and emphasis on this important refuge species in this final comprehensive conservation plan (CCP). Moreover, data indicate steady growth of trumpeter swan numbers at the refuge, Centennial Valley, and state levels, and not an 'apparent recent decline in the refuge's population' (please see further comments on this point below).

Comment 2: *We encourage continued meetings between staff from Yellowstone National Park, other federal and state agencies, and stakeholders in the tri-state range to pursue a vision and agenda for the cooperative, integrated management of trumpeter swans.*

Response 2: The Service plans to continue to participate in this coordination effort.

Comment 3: *We ask that attention be given to actually improving breeding conditions on the refuge to improve the survival rate and long term outlook for the swan. We believe this charismatic species is important for maintaining biological diversity, posterity of our natural heritage, and public interest in continuation of funding for the refuge*

If managers do not reverse the recent declines in swan nesting and cygnet production at RRLNWR [Red Rock Lakes National Wildlife Refuge], the persistence of nesting trumpeter swans in Yellowstone National Park, and in the entire Greater Yellowstone region, will become much more precarious.

Response 3: The number of nests and cygnets fledged in the Centennial Valley has remained relatively static since 1993 ($\bar{x} = 13.1, \hat{\beta} = 0.00, SE = 0.03, P = 0.98$, and $\bar{x} = 22.1, \hat{\beta} = -0.07, SE = 0.05, P = 0.22$), the first nesting season after the termination of winter feeding. The most notable decline in swan production in the last several decades was associated with management actions in the 1990s intended to expand the winter range of the Rocky Mountain Population of trumpeter swans. Efforts included the

termination of winter feeding at Red Rock Lakes NWR, translocation of >1000 swans from the refuge and Harriman State Park (HSP) to more southerly (or at least areas lower in elevation) wintering areas, and hazing of wintering swans from the refuge and HSP. It was predicted that these management activities would "cause a short-term decline in the Centennial Valley trumpeter swan flock" (USFWS 1992). The effects of these actions were much greater, and have been more persistent, than envisioned. For example, the average number of cygnets fledged in the Centennial Valley during the period 1967–1992 was 55.9 (SE = 8.7), which declined to 21.1 (SE = 3.0) during the last 16 years. However, the population has been recovering during this period—the number of adults has been increasing at an annual average rate of 3.5% (SE = 0.01, $P > 0.01$) in the Centennial Valley since 1993, while the total number of swans increased at an average annual rate of 2.3% (SE = 0.01, $P = 0.05$).

Comment 4: *Our foremost concern is that this draft CCP/EA is fundamentally flawed because it is built upon a false foundation. The draft fails to accurately describe the refuge's Establishment and Acquisition History and identify the purpose for establishing this refuge ... ignored these historic facts and excluded all mention of trumpeter swans.*

Response 4: The planning team is fully aware of the significant role the refuge played in the recovery and continued support of the trumpeter swan. To emphasize this, additional language has been added to the final CCP in the establishment history sections.

THE FINAL CCP

Comment 5: *We are concerned that this draft provides no future management direction for trumpeter swans other than implying that somehow a decision has already been made "in favor of allowing the swans to thrive under mostly natural conditions." This is a particularly inappropriate choice of words, given the serious problems facing nesting trumpeter swans at Red Rock Lakes National Wildlife Refuge and the surrounding region, and their obvious failure to thrive under current management direction.*

Response 5: As mentioned above, the number of trumpeter swans in the Centennial Valley is increasing. Future management of trumpeter swans in the Centennial Valley by the refuge will occur within the framework of the "Pacific Flyway Management Plan for the Rocky Mountain Population of Trumpeter Swans." This plan contains population objectives for the Centennial Valley, and has been added to the final CCP.

Comment 6: *The draft makes no mention of: (1) the importance of cygnet production at RRLNWR to the future viability of the regional nesting population*

including the persistence of nesting trumpeters in Yellowstone National Park, (2) the declines of nesting and cygnet production on the refuge including the total nesting failure in 2008 for the first time in refuge history, or (3) the importance of Culver and MacDonald ponds to provide late winter/early spring pre-breeding forage for local nesting swans.

Response 6: Tri-state area trumpeter swans have exhibited positive growth rates since the termination of winter feeding at both regional and state levels. This has occurred even though there was no apparent trend in cygnet numbers for the region or individual states, excluding Wyoming. Consistent population growth across multiple scales within the tri-state region provides support for the current levels of cygnet production sustaining the “future viability of the regional nesting population.” The refuge will continue to work with Yellowstone National Park, and other partners, to work toward maintaining a viable nesting population in the park.

The poor production observed in 2008 is most likely due to the late spring experienced across much of the tri-state area. For example, significant areas of the refuge lakes were still ice-covered in early May, just prior to the normal peak nest initiation period for swans. The effect of the late spring was evident throughout the tri-state area for swans, with below average number of cygnets produced. Moreover, significant nesting failures are not unprecedented in the Centennial Valley or the refuge. For example, only four cygnets fledged from forty-one nests attempts on the refuge in 1980.

Seemingly extreme variation in annual production is expected in long-lived species in variable environments. Reproduction is considered ‘costly’ to individuals due to the increased mortality risks associated with breeding and caring for young. This results in a trade-off between reproductive effort and adult survival, and suggests that individuals must balance the immediate cost of reproducing in a given year and the probability of future reproductive success. For short-lived bird species this typically results in most, or all, individuals breeding each year regardless of conditions—their chance of surviving to breed again is low, so they have little choice but to breed in an effort to maximize their lifetime reproductive success. They have to put all their proverbial ‘eggs in one basket’. However, in long-lived bird species individuals are likely to survive for multiple breeding seasons. Therefore, they can optimize their lifetime reproductive success by not breeding at all, or abandoning their brood during poor years, surviving to breed in years where the likelihood of fledging young is greater. For trumpeter swans, which can live more than 20 years in the wild, maximum fitness can be achieved by foregoing breeding in a poor year, waiting until better conditions are available to attempt nesting and rearing of young. This is why (1) significant variation

in annual swan production is expected, and (2) excessive focus on parameters of annual production is ultimately unproductive.

For support of the latter point, let’s briefly consider the population dynamics of trumpeter swans in the tri-state area over the last seven decades. Initial conservation efforts beginning around 1935 were very successful in 1) protecting the last known breeding population in the contiguous United States, and 2) expanding that population in the tri-state area to more than 500 individuals by 1951. The tri-state flock remained near this number, with considerable vacillations, until 1993 when 277 swans were found during the fall survey. This was the result of management actions taken to expand the winter range of the Rocky Mountain Population of trumpeter swans in an effort to reduce their susceptibility to winter mortality. During the 5 decades before 1993, the number of swan nests in the Centennial Valley often exceeded 60; the average number of nests in the valley from 1967 to 1992 was 45.1 (SE = 2.4). However, even with this exceptional level of nesting effort in the Centennial Valley alone, the tri-state population remained relatively static, hovering near a mean of 500 individuals for nearly 50 years. Since 1993, the number of swans in the Centennial Valley, and throughout the tri-state area, has been steadily increasing, even at significantly lower nest numbers than occurred before 1993. We therefore believe that the future of swan management in the tri-state is determining what limiting factor(s) have prevented the flock from consistently exceeding the threshold experienced during the latter half of the 1900s, and not through singular focus on productivity parameters for a long-lived species.

If Culver and MacDonald ponds provide important “late winter and early spring pre-breeding forage for local nesting swans” we would expect an increasing level of use of the ponds in March and April, after spring migrants have left the area. Refuge data do not support this supposition—weekly surveys of the ponds indicate static numbers of swans during March, with declining use as soon as other open-water areas are available in the valley.

The refuge is proposing to further investigate the importance of these ponds to pre-breeding swans prior to removal for restoration of Picnic and Elk Springs creeks.

Comment 7: *The plan fails to discuss that managers have considerable control over two factors that can significantly impact swan nesting success and productivity, e.g. management of the Lower Lake water control structure and human disturbance during the nesting and brood rearing periods.*

Response 7: The CCP highlights minimizing disturbance to swans in several areas. Additionally, no changes to current closures for nesting swans on

the primary nesting areas were proposed. Recent efforts to manipulate water levels have demonstrated that managers do not have “considerable control” over Lower Red Rock Lake water levels. Manipulating the water control structure does not change water levels as much as was previously anticipated. The refuge’s ability to manipulate water levels on Lower Lake is limited by the scale of the system, its connectivity within the watershed to Upper Red Rock Lake, and the influence of groundwater dynamics.

Comment 8: *The draft CCP/EA fails to include any goals or objectives pertaining to reversing the declines in nesting pairs and cygnet production and fails to analyze the impacts on trumpeter swans of proposed actions such as the proposed increases in human disturbance from fishermen, photographers, hunters, and increased monitoring; alteration of habitat and loss of swan nesting territories at various wetlands; and the proposed water level management regime.*

Response 8: Future management of trumpeter swans in the Centennial Valley by the refuge will occur within the framework of the “Pacific Flyway Management Plan for the Rocky Mountain Population of Trumpeter Swans.” Population objectives for the Centennial Valley have been added to this final CCP.

Spatial and temporal separation of refuge visitors and nesting swans will be maintained to preclude increased disturbance if visitor use levels increase.

The draft plan recognized that a single created swan nesting territory located along Pintail Ditch will be impacted during drought conditions but would continue to provide nesting habitat during average and above average water years.

Increased monitoring is largely focused on habitats not utilized by swans, e.g., sagebrush-steppe habitat.

The enhancement of wetland productivity through improved water level management would primarily be for the benefit of waterfowl, including trumpeter swans. This was stated in the objectives and rationale statements.

Comment 9: *There is no mention that the trumpeter swan is a Region 6 Focal Species and that there are specific population objectives for the refuge in the “Pacific Flyway Management Plan for the Rocky Mountain Population of Trumpeter Swans” approved by the Flyway Council in July 2008.*

Response 9: Future management of trumpeter swans in the Centennial Valley by the refuge will occur within the framework of the “Pacific Flyway Management Plan for the Rocky Mountain Population of Trumpeter Swans.” Population objectives for the Centennial Valley have been added to this final CCP.

Comment 10: *A revised draft should recognize that simply quoting the generic language from the authorizing authority is often not adequate to identify the specific purpose for which a refuge was established.*

Response 10: The language in the executive orders and establishing legislation are the only legislative purposes for this refuge. Issues at the time of establishment that were the catalyst for establishing a refuge do not have the same weight as these legislative purposes.

Comment 11: *We suggest that the Vision Statement describe a desired future condition in which Red Rock Lakes NWR is a conservation leader in the regional efforts to protect and restore Greater Yellowstone’s nesting trumpeter swans and swan nesting habitat on the refuge managed to improve nesting success and cygnet production. It would also be appropriate to include a desired future condition for other wildlife.*

Response 11: The vision statement is a broad description of the desired conditions for the refuge and its role in protecting and preserving the surrounding Centennial Valley. The intent of the vision statement was never to prioritize for single-species management but rather identify how the refuge can support all migratory and resident wildlife through proper habitat management and protection, including the trumpeter swan. More specifics for target wildlife species have been detailed in the objectives and strategies in chapter 4.

Comment 12: *Additional goals and objectives should be added specific to trumpeter swan management.*

Response 12: Future management of trumpeter swans in the Centennial Valley by the refuge will occur within the framework of the “Pacific Flyway Management Plan for the Rocky Mountain Population of Trumpeter Swans.” A specific objective and set of strategies supporting this CCP have been added to chapter 4. The refuge will continue to work with the broader waterfowl management community to set objectives for trumpeter swan management.

Comment 13: *Expansion of big-game hunting should not be permitted in areas that have been set aside as fall waterfowl feeding sanctuaries. The location of fall sanctuary feeding areas for swans and other waterfowl should be clearly portrayed on refuge use maps.*

Response 13: No waterfowl sanctuaries will be opened to expanded waterfowl hunting opportunities. The only expanded big-game hunting near lands set aside for fall waterfowl sanctuary are Sparrow Pond and Sparrow Slough. These waters have been open to nonconsumptive public recreation for decades without significant disturbance to waterfowl. These areas will still be closed to waterfowl hunting.

Big-game hunting is not expected to cause significant conflict. Most big-game hunters arrive in late October during the general open season. Refuge waters usually freeze in late October, so the birds move to larger bodies of water than Sparrow Pond/Slough. The final maps identify these areas.

Comment 14: *The fall hyperphagia period is very important for trumpeters to gain the energy reserves that will help them survive winter and sanctuary areas that contain high quality food are very important.*

Response 14: The draft and final CCP supports this.

Comment 15: *No actions should be proposed that would eliminate or reduce the suitability of historically productive swan nesting territories.*

Response 15: None of the proposed actions eliminate or reduce the suitability of historically productive swan nesting territories.

Comment 16: *No actions should be proposed that would reduce food resources available to Centennial Valley breeding pairs during the crucial late winter pre-breeding period when pairs gain the nutrient reserves essential for successful nesting. This is of particular concern at spring-fed ponds, such as Culver and MacDonald, where the most important spring food plant, *Elodea canadensis* has been abundant in the past.*

*The spring-fed ponds on the refuge, where ice is thin or non-existent, are extremely important for making *Elodea* available as nesting pairs return to the refuge in late winter/early spring. The proposal to eliminate Culver and Macdonald ponds could therefore have significant adverse impacts on refuge nesting pairs and should be abandoned.*

Response 16: Proposed management of wetlands on the refuge will increase the food resources available to pre-breeding swans. If Culver and MacDonald ponds do provide important late winter/early spring pre-breeding forage for local nesting swans, we would expect an increasing level of use of the ponds in March and April, after spring migrants have left the area. Refuge data do not support this supposition—weekly surveys of the ponds indicate static numbers of swans during March, with declining use as soon as other open-water areas are available in the valley.

We believe that a single study showing that confined adult trumpeter swans preferred waterweed (*Elodea canadensis*) over other aquatic plants offered to them is not enough evidence to make the inference that this plant is “the most important spring food plant” for breeding swans. Studies of wild swans have demonstrated that swans select waterweed proportional to its availability. Moreover, empirical evidence suggests that pre-nesting trumpeter swans prefer pondweeds (*Stuckenia* spp. and *Potamogeton*

spp.), especially sago pondweed (*S. pectinata*), during the late-winter and early spring.

Refuge management is proposing to further investigate the importance of these ponds to pre-breeding swans prior to removal for restoration of Picnic and Elk Springs creeks.

Comment 17: *The draft CCP should clearly recognize the crucial importance of cygnet production to the dispersal of subadults and rebuilding of successful nesting on adjacent portions of the Centennial Valley west of the refuge and in nearby areas of Idaho and Yellowstone National Park.*

Response 17: Evidence supporting the statement that cygnet production on the refuge is of “crucial importance ... to the dispersal of subadults and rebuilding of successful nesting on adjacent portions of the Centennial Valley west of the refuge and in nearby areas of Idaho and Yellowstone National Park” is lacking—please see our comments regarding this topic above.

Comment 18: *Given the great interest in SAV management in the draft, we are quite surprised that the draft CCP/EA does not reference the extensive summary of the refuge’s historic SAV information written for the Service in 1987 by David Paullin, Dr. Oz Garton, and Ruth Shea Gale.*

Response 18: The CCP included a summary of historic SAV information, including David Paullin’s thesis.

Comment 19: *The proposed action promotes destruction of MacDonald and Culver Ponds—ponds which are integral to the historical legacy of the refuge and presently provide one of the last undisturbed winter roosting (habitats) for remaining trumpeter swans and bald eagles. The removal of these ponds is intended to restore stream function, yet the plan concedes that at least one historical trumpeter swan nesting territory will be eliminated.*

Past data on movements of marked refuge trumpeters indicate that local swans would most likely merely be displaced to other nearby heavily used wintering sites in Idaho. There are no data to support the statement that removing this pond habitat would further expand the winter range of the Rocky Mountain Population of trumpeter swans.

Response 19: This document states that removing the ponds will “further efforts to expand the winter range,” not that it will expand the winter range per se. This is consistent with the winter range expansion program that is the top focus of The Trumpeter Swan Society (http://www.trumpeterswansociety.org/at_work.htm).

Comment 20: *Because *Elodea* is highly vulnerable to over-winter mortality, this species’ ability to survive frequent fall-winter draw-downs should*

be thoroughly explored before a strategy involving frequent late-season draw-downs is implemented.

Response 20: ‘Frequent’ late-season drawdowns are not a strategy in the document.

Comment 21: *The draft CCP fails to recognize the ecological importance of the refuge to the Greater Yellowstone Ecosystem (GYE) and to discuss key ecosystem habitat and wildlife population issues that would potentially be impacted by refuge management.*

Response 21: The CCP does recognize the value and importance of the refuge within the GYE. Additional language has also been added to chapter 1.

Comment 22: *Rather than considering the refuge in the context of the GYE, the draft CCP discusses “Ecosystem Description and Threats” in the context of a huge watershed entity (the Upper Missouri-Yellowstone-Upper Columbia River ecosystem), which extends from the Canadian border in northwestern North Dakota to the Continental Divide immediately south of Red Rock Lakes National Wildlife Refuge. This watershed approach has little relevance for migratory bird management. The FWS [U.S. Fish and Wildlife Service] “ecosystem approach” failed and was abandoned, largely for that reason.*

Response 22: Evaluation of the refuge in the context of larger ecosystems identified and described by the Service is a standard part of a CCP. We have added information about the GYE in chapter 1.

Comment 23: *National Wildlife Refuges are supposed to be a “system” of lands, however there is no mention of the relationship of other refuges in the tri-state area that are connected by shared migratory bird resources including trumpeter swans.*

Response 23: The CCP does acknowledge connectivity to other public lands in the surrounding area by supporting national and regional conservation plans such as the “North American Waterfowl Management Plan,” Partners in Flight plans, “Pacific Flyway Management Plan for the Rocky Mountain Population of Trumpeter Swans,” and “Coordinated Implementation Plan for Bird Conservation in Western Montana.”

Comment 24: *There is no discussion of the inter-relationship of other habitat areas managed by agencies, tribes, or private individuals that are collectively important for migratory bird conservation.*

Response 24: In chapter 1 we recognize the importance of several other plans that address nationwide planning efforts and objectives for migratory wildlife species.

Comment 25: *There is no mention of the 2008 Pacific Flyway for Rocky Mountain Population of Trumpeter Swans, the North American Waterfowl Management Plan, the Intermountain West Joint Venture, or the wildlife action plans in the Tri-State area.*

Response 25: These plans were either listed in chapter 1 or have since been added to the final CCP.

Comment 26: *There also appears to have been little or no coordination even with other programs within the FWS.*

Response 26: Refer to the participant list in this appendix. There was extensive collaboration with state and other federal partners, including other Service divisions.

Comment 27: *Trumpeter swans are not at all “thriving” at RRLNWR under current management and they are unlikely to do so in the future without close attention to their habitat needs and active management [of] the refuge.*

Response 27: Consistent population growth rates approaching 4% per year, which is what trumpeter swan populations in the Centennial Valley are achieving, would be considered ‘thriving’ by most wildlife professionals’ standards. For example, the mid-continent population of snow goose reached population levels that exceeded the carrying capacity of their nesting grounds, resulting in considerable efforts to reduce their abundance. This population grew at an average annual rate of 4% prior to management efforts to reduce their numbers. The document does outline management actions for wetland habitats that will support and promote trumpeter swan reproduction and survival.

Comment 28: *The draft CCP/EA fails to include any goals or objectives pertaining to reversing the declines in nesting pairs and cygnet production.*

Response 28: Refuge data do not support this statement that swans are declining. Cygnet production was very low in 2008 at two birds. However, production has been stable over the past five years. The twenty-two young counted in the 2009 survey was not significantly below the average of 25.4. The number of nesting pairs is stable.

ARCTIC GRAYLING

Comment 29: *The preferred alternative should include stronger language designed to achieve its fisheries objective.*

Response 29: If greater specificity in the objective is what is meant by ‘stronger language’ then the step-down Habitat Management Plan, to be completed once this CCP is finalized, will address this concern. Specific objectives for Arctic grayling were added.

Comment 30: *Specific time frames (within 2 years, etc.) seem to be missing from the major fisheries objectives. “Within 15 years” is too weak.*

Response 30: A longer time period will be necessary to accomplish fisheries objectives due to the need to ensure minimum or no effect on other wildlife, especially trumpeter swans.

Comment 31: *“Description of Consequences by Resource” (p. 92 draft CCP) states “The environmental consequences discussed in this chapter are the potential effects on a resource as a result of carrying out the actions of an alternative.” How then can each alternatives narrative on Habitat and Wildlife concerning the Lower Lake, lack a discussion of an actions effect on this lake’s fishery resource and in particular on Arctic grayling?*

Response 31: Existing data (for example, Nelson 1953, USFWS unpublished data) demonstrate very limited use of Lower Red Rock Lake by Arctic grayling. Additionally, the time period where Lower Lake can provide grayling habitat is limited due to the lake freezing to the substrate in the winter and exceeding temperatures lethal to grayling during the summer.

Comment 32: *Lowering Lower Lake would provide opportunity for waterfowl habitat; however, it could have significant impact on the native population of Arctic grayling that use Lower Lake and Odell Creek.*

Response 32: Existing data (for example, Nelson 1953, USFWS unpublished data) demonstrate very limited use of Lower Red Rock Lake by Arctic grayling thereby limiting the probability of a ‘significant impact’ to the population.

Comment 33: *Management actions pertaining to Lower Lake /River Marsh sections simply relate to aquatic vegetation and waterfowl. I wonder why this document failed to address the possible effects that manipulating water levels may have on this lake’s fish community.*

Response 33: The refuge and the lake are managed for waterfowl and waterbirds, following the purpose for the refuge. There may be impacts to the burbot population, but these impacts are uncertain.

Comment 34: *Address the environmental consequences that actions contained in the proposed action may have during Arctic grayling migrations through the Lower Lake and River Marsh.*

Response 34: Migrations of Arctic grayling through River Marsh and Lower Lake will be minimally effected by the proposed action. While dependent upon runoff, spring (pre-spawning) and early summer (post-spawning) water levels will continue to provide deep water corridors for fish movement. It is important to note that this population of Arctic grayling evolved without dams and water control

structures obstructing fish passage, and that the population decline of grayling has been concurrent with habitat changes over the last century, including the placing of a water control structure on Lower Lake.

Comment 35: *By omitting fisheries information from this document, does one assume that the Service has written off grayling in this area of the refuge and written off the value the Lower Lake/River Marsh has to the grayling population as a whole in the system?*

Response 35: Current data do not demonstrate that Lower Red Rock Lake and River Marsh provide critical habitat for Arctic grayling. These water bodies are critical to waterfowl, including trumpeter swans.

Comment 36: *The CCP covers only native Arctic grayling. Is that the only native sport fish in the lakes?*

Response 36: Grayling and mountain whitefish are the only native game fish present on the refuge. Native Westslope cutthroat trout only exist as hybridized fish with nonnative Yellowstone cutthroat and rainbow trout. The CCP does recognize these other native fish in the plan, but none are as imperiled as grayling.

Comment 37: *As for nonnative fish present in the lakes, it is not clear what species they are nor what method would be used to eradicate them as proposed.*

Response 37: Nonnative Yellowstone cutthroat, rainbow, and brook trout all probably utilize Upper and Lower Red Rock Lakes to some extent but Lower Lake is very shallow and temperatures are too high in the summer for trout. As grayling restoration work continues, the refuge will work closely with fisheries biologists to develop methods to reduce the nonnative fish species.

Comment 38: *We were troubled by the fact that the plan focused on Arctic grayling as the main species it will manage and restore riparian habitat for. We would like to see how it will consider species of conservation concern (Montana Natural Heritage Program) other than Arctic grayling in management decision[s]—and how management conflicts will be dealt with, if they exist.*

Response 38: We do not feel that the document focused on Arctic grayling. Dozens of other species of wildlife were mentioned and discussed; however, the document does recognize that the refuge has one of the last endemic populations of adfluvial Arctic grayling in the continental United States and are a state species of concern. It is the Service’s responsibility to ensure that species of concern do not become threatened or endangered. The most significant management actions are focused on

waterfowl and other migratory birds, the purposes for which this refuge was established.

Comment 39: *I doubt that the grayling are severely affected by the presence of Culver and McDonald ponds and there are other strategies that would benefit them far more than the draining of these two ponds. I would not drain them as they have a historic value and are used extensively by wildlife.*

Response 39: Culver and McDonald ponds are artificial ponds caused by the damming of streams that were historically used by spawning Arctic grayling. The majority of modified or created refuge ponds will remain intact for migratory birds and other wildlife.

Comment 40: *I support alternative B for stream corridors but would go so far as to say that there should be consideration of the expansion of the refuge to encompass the upstream areas that have grazing practices that are harmful to the refuge.*

Response 40: The refuge will continue to work with upstream landowners to reduce off-site impacts to refuge waters—a program that has been successful in the past.

WETLANDS

Comment 41: *What criteria was used to classify Lower Lake as its own entity and not include it in sections discussion of ‘natural lakes’ or ‘modified wetlands’? On p. 23 (draft CCP), the Lower Lake and River Marsh are described as being influenced by a series of water control structures.*

Response 41: Scale, connectivity with the other lakes, and ability to manipulate water levels were considered when separating Lower Red Rock Lake and River Marsh from ‘natural lakes’ and ‘modified wetlands’. While the outflow of Lower Lake has a water control structure on it, the ability to manipulate water levels is not as great as on smaller modified wetlands. This is due in part to the size of the Lower Lake and River Marsh area, its connectivity to Upper Red Rock Lake, and the influence of groundwater moving through the system.

Comment 42: *The proposed action of not diverting water to some units unless the snowpack exceeds the 30 year high could result in the loss of water rights. I didn’t see that issue discussed.*

Response 42: The Federal Reserved Water Right (1999) compact protects the refuge’s water right for the purposes of the refuge including wildlife habitat maintenance and enhancement. The proposed actions fulfill the purposes of the refuge.

Comment 43: *The preferred alternative briefly describes significantly changing water management on the refuge, but doesn’t adequately discuss the*

how this will benefit the original purpose of the refuge. The CCP doesn’t address any changes on downstream habitats and water users.

Response 43: The water management is not ‘significantly’ different but the rationale in chapter 4 does explain the benefits of the objectives and strategies and includes monitoring of the effects on downstream users.

Comment 44: *The purpose of encouraging waterfowl to migrate to historical wintering areas may be successful for certain species, but it is not guaranteed.*

Response 44: We concur and were careful to use ‘encourage’ in our statement due to these uncertainties.

Comment 45: *Culver and MacDonald ponds should not be restored to natural streams.*

Response 45: Arctic grayling are a species of concern in Montana. Grayling spawning habitat was eliminated by the damming of two streams to create Culver and MacDonald ponds. Restoration of these streams will provide the opportunity to more than double the number of creeks used by spawning grayling in the Centennial Valley. The refuge will still have thousands of acres of wetlands that will provide productive habitat for trumpeter swans and other migratory birds and resident wildlife.

Comment 46: *Since 1988, FWS has never had a coherent plan for using the water control structure on the Lower Lake. Now, FWS proposes to open the gates permanently – except for “ecological experiments” and allow “a naturally fluctuating hydrological cycle.” The plan does not analyze the impact of this proposal on waterfowl hunting.*

Response 46: A memorandum of understanding (MOU) with the local water-user’s group was signed February 4, 1987, providing a “coherent plan” for the management of the Lower Red Rock Lake water control structure. The foundation of management set forth by the MOU was built upon in 2004 with an adaptive management plan intended to increase the productivity of the wetland impacted by the water-control structure. The purpose of the ecological experiments is to improve the understanding and management of the WCS and surrounding hydrological system, including its effects on waterfowl. The refuge presented this CCP to, and received comments from, duck hunters, Montana Fish, Wildlife and Parks, and conservation organizations including Ducks Unlimited, Inc, and The Trumpeter Swan Society. Copies of these, and other management plans, can be obtained from the refuge.

Comment 47: *Lower water levels do not provide access into River Marsh, an area that has been*

waterfowl hunted for over 100 years. The Service needs to disclose these impacts and estimate how many years hunting by boat will be impossible or nearly impossible.

Response 47: Refuge staff regularly accesses River Marsh at the water levels claimed to exclude duck hunting. Also, fall water levels will be maintained at the refuge's current legal right, excluding years when a drawdown is scheduled.

Comment 48: *There is no question that many more swan nested on the refuge when water levels on Lower Lake were kept at a higher level. Altering water levels would give the refuge an opportunity to observe how different water levels on the lake might influence water use in the various seasons.*

Response 48: The reduction of nesting swans in recent history is the result of efforts to expand the winter range of the Rocky Mountain Population of trumpeter swans. This occurred in 1992–93, over a decade prior to the water levels being lowered on Lower Red Rock Lake.

Comment 49: *Consideration should be given to a late summer increase in lake elevations through a reduction in Lower Lake outflows—enhancing migrating and staging habitat for waterfowl and providing better distribution of waterfowl during hunting season.*

It's time to stop treating water management of Lower Lake as an ecological experiment that changes with each generation of managers and biologists. Adopt a management scheme that seeks to replicate conditions created at the lake 1930–88 offering greater public opportunity and staging areas for waterfowl. At a minimum, we believe water levels should be raised to provide safe, reasonable public access during waterfowl hunting season.

Response 49: The refuge will work within the existing memorandum of understanding with the local water-users group to provide enhanced staging and migrating habitat in the late summer and fall for waterfowl. This will be largely accomplished by maintaining water levels at the refuge's current legal water right during the fall, excluding years when a drawdown is scheduled.

Comment 50: *The system of ditches and headgates associated with Odell Creek appears to allow useful irrigation of meadows and pastures which enhances wildlife habitat and waterfowl nesting habitat. I see no reason to retire them.*

Response 50: We believe the costs associated with diverting water from Odell Creek do not outweigh the benefits. There are greater than 7000 acres of naturally occurring wet meadow habitat on the refuge, similar to what could be created by irrigating 'meadows and pastures' by diverting Odell Creek. However, Odell Creek is one of only two creeks that

support spawning grayling in the Centennial Valley. Therefore, we believe the most beneficial use of Odell Creek water is for instream flow to benefit Arctic grayling.

Comment 51: *Culver and MacDonald ponds are historic pieces of the valley and serve a purpose that was well thought out 75 years ago. Removal of historic structures should require an EIS.*

Response 51: The historical significance of these water control structures was investigated and found to not be of historical significance by the Montana state historic preservation officer (July 22, 2009).

Comment 52: *Consider operating the water control structure on Lower Lake at 6608 msl in September and October to accommodate boater use. The proposed alternative proposes opening all the gates so to provide for a naturally fluctuating hydrological cycle. The failure to consider operating the WCS so as to provide more water is inconsistent with the management history of Red Rock Lakes National Wildlife Refuge and fails to provide reasonable recreational access to the Lower Lake and River Marsh.*

Response 52: The refuge will maintain Lower Red Rock Lake water levels during the fall, within the constraints imposed by climatic variability and the existing water-control structure, at 6607.5 feet above mean sea level (msl). Periodic (every 4–7 years) drawdowns of Lower Lake to increase the productivity of the wetland system will be the exception to this. Maintaining Lower Lake water levels at 6607.5 msl, the refuge's legal water right, will provide increased habitat for staging and migratory waterfowl. The current strategy of leaving the water control structure open will continue during the spring and early summer for the benefit of nesting trumpeter swans and other waterfowl.

Comment 53: *Converting Culver and MacDonald ponds is detrimental to waterfowl winter habitat, including swans. The refuge has been vital to swans and should continue to be.*

Response 53: We believe that the presence of winter habitat on the refuge is detrimental to trumpeter swans and therefore believe removal of the ponds will ultimately benefit this population.

Comment 54: *There must be recognition that, even in this isolated area, the ecosystem and natural processes have been significantly altered by human activities. A "hands off" approach is a recipe for further deterioration of habitats and the populations of migratory birds that depend on them.*

Response 54: This CCP clearly recognize that the refuge has been altered by human activities and that active management, such as managing water levels and controlling invasive species, is important

to properly manage this refuge. Nevertheless, there are areas that are still intact and functioning much as they did prior to settlement in this valley. These areas will be monitored and maintained to protect their integrity.

Comment 55: *Because Elodea is highly vulnerable to over-winter mortality, this species' ability to survive frequent fall-winter draw-downs should be thoroughly explored before a strategy involving frequent late-season draw-downs is implemented.*

Response 55: Frequent late-season drawdowns are not a strategy in the document.

ALTERNATIVES/CONSEQUENCES

Comment 56: *We strongly believe that the complex issues involving numerous threatened, endangered and/or species of concern and the equally complex inter-relationships of the management options involving the critical wetlands and uplands of the refuge, compel the preparation of a comprehensive Environmental Impact Statement. We urge the Service to maintain the status quo of the refuge (identified as alternative A) unless and until such a comprehensive EIS is completed and the full NEPA process is followed.*

Response 56: The preferred alternative is not a major federal action that would significantly affect the quality of the human environment within the meaning of Section 102(2)C of the National Environmental Policy Act of 1969. Accordingly, the preparation of an Environmental Impact Statement is not warranted. The issues identified in this document are not significant, nor are the proposed changes to the management of the refuge. There are no known endangered or threatened species that regularly use the refuge.

Comment 57: *The preparation of a comprehensive Environmental Impact Statement (EIS) would certainly be in the best interests of all concerned. The additional time necessary to prepare the EIS will pay huge dividends in determining and understanding the exact long term, potentially devastating impact expanding the hunting privileges will have on this magnificent area.*

Response 57: Hunting is a compatible, traditional public use of this refuge and the refuge system as a whole. The expanded hunting opportunities should not detract from the purpose for which this refuge was established and will be monitored and modified to ensure these hunts are ethical, safe, and meet the desired objectives.

Comment 58: *Although the analysis of environmental consequences contains a section entitled "Habitat and Wildlife," only habitat is discussed; there is no mention of impacts on wildlife species, populations, or species groupings.*

Response 58: Impacts on wildlife species and species groupings are provided throughout chapter 5's "Habitat and Wildlife" section of the draft CCP. Additional impacts have also been added to the final CCP.

LANDSCAPE PERSPECTIVE

Comment 59: *The draft CCP/EA completely whites-out all adjacent portions of Idaho and omits them from all discussion, as if an ecological wall existed along the Idaho/Montana state line. This likely has more to do with the fact that the state line forms the Region 6–Region 1 administrative boundary than with any ecosystem context for refuge management. This section should be completely rewritten.*

Response 59: The Service and the refuge has and will continue to work with it's partners in Idaho and other bordering states in managing migratory wildlife, including trumpeter swans. This CCP considered the refuge in the context of the Upper Missouri, Yellowstone, and Upper Columbia Rivers Ecosystem and includes partnering across state lines to achieve common goals for migratory wildlife species.

We added a description of the GYE as well, which includes Idaho.

Comment 60: *I think it is important to look at the refuge in the context of the whole Centennial Valley. Wildlife conservation on the refuge will depend, to a significant extent, on habitat quality in other parts of the valley. This means outreach to private landowners downstream and especially upstream of the refuge in addition to working with state and federal agencies. This means greater emphasis on restoration.*

We encourage the refuge staff and the USFWS [U.S. Fish and Wildlife Service] to deepen its relationships with private landowners in the Centennial Valley, specifically with the Centennial Valley Association. We also encourage the USFWS to continue its good work with other agencies such as the U.S. Forest Service, Bureau of Land Management and the State of Montana to ensure the valley is managed in a holistic manner.

Response 60: This document did attempt to consider the Centennial Valley as a whole and its impacts on the refuge. We do realize that the refuge is not an island. Such programs, such as the conservation easement program, have been successful in protecting private lands while maintaining a working landscape. The refuge will continue to work with surrounding landowners and other partners to achieve common goals and protect this unique resource.

Comment 61: *There was no discussion of how the refuge fits in with surrounding protected areas and*

the Pacific Flyway? How does it fit into the Greater Yellowstone Ecosystem? Does it have a role in the grizzly bear or wolf recovery plans?

Response 61: The document does discuss national, state, and regional plans in which the refuge has a role to play. The refuge currently does not participate in any wolf or bear recovery plans.

Comment 62: *We urge the refuge to work with adjacent landowners to achieve wildlife connectivity across the entire landscape.*

Response 62: The refuge's conservation easement and fee title program focus on achieving this goal. For example, through these programs a continuous connection on the east end of the valley has been created from the BLM to the south across the valley to U.S. Forest Service (USFS) land to the north (see figure 6, conservation easement map).

Comment 63: *The plan fails to recognize the ecological importance of Red Rock Lakes in the larger conservation landscape, namely the Greater Yellowstone Ecosystem and the Pacific Flyway and to discuss key ecosystem habitat and wildlife population issues that would potentially be impacted by refuge management.*

Response 63: The CCP does recognize the value and importance of the refuge within the GYE.

Comment 64: *There is no discussion of existing management, conservation projects, or research conducted by BLM [Bureau of Land Management], USFS, or private lands in the valley by organizations such as Wildlife Conservation Society or American Wildlands. How will the refuge collaborate in those activities outside the refuge boundaries?*

Response 64: The refuge has a long history of working with neighboring landowners and other partners interested in conserving the Centennial Valley. This document supports maintaining and expanding those efforts.

Comment 65: *The CCP does not address the refuge's importance as a regional link in providing habitat connectivity between the GYE and core habitats further west.*

Response 65: This document does recognize that the refuge is an important link between the GYE and the Bitterroot ecosystems.

Comment 66: *We are unclear from reading the plan how many of these inholdings are within the refuge. Any work to secure easements or fee title to inholdings should be given a priority, simplifying management and protecting wildlife.*

Response 66: The maps do depict all refuge inholdings. The refuge has worked through fee title and the

conservation easement program to acquire many of these lands or ensure they do not become developed.

Comment 67: *The plan indicated that tree densities have increased and forests have expanded into the adjacent sagebrush/grassland habitat due to grazing. Because sagebrush is rare, it seems important to reverse this trend.*

Response 67: This issue is at a landscape scale in the valley with limited acres impacted on the refuge. The refuge is working with the BLM and other interested partners to address this.

Comment 68: *The Service needs to assess the implications of climate change on all the alternatives in the plan. Be proactive in developing management alternatives that account for climate change in management objectives and strategies.*

The CCP should consider the effects of climate change and how the refuge can help adapt to mitigate wildlife impacts. The anticipated effects of climate change and prudent management responses should be carefully considered and described during the CCP process.

Response 68: The document does discuss some of the effects global warming has had on the refuge and did consider climate change in making management decisions. Climate change will be further considered in the step-down management plans, which can be readily adjusted to address changing conditions. Also, addressing climate change in these documents is evolving as more information is gained.

The document recognizes climate change as having an effect on refuge habitats, including more frequent droughts causing a loss of wetland habitat. We also modified the CCP to keep Lower Lake dam in place to provide greater management flexibility if droughts become more frequent and severe. Through the conservation easement program the Service can maintain key corridors for wildlife migration and allow them to adjust to habitat changes caused by global warming.

Comment 69: *Sagebrush-steppe habitat is expected to disappear if global warming continues. The refuge needs to take a proactive approach and identify specific climate change and formulate appropriate management strategies.*

Response 69: This is a 15-year document and it is not probable that the refuge will lose sagebrush-steppe habitat during this time period.

Comment 70: *Focus on managing the refuge to maintain and enhance wildlife connectivity for wide-ranging species, toward re-connecting partially or wholly disjunct wildlife populations in Greater Yellowstone to outside populations in Idaho and beyond.*

Response 70: This document enhances the refuge's ability to maintain its role as a migratory corridor for various wildlife species.

Comment 71: *There is no discussion of the inter-relationship of other habitat areas managed by agencies, tribes, or private individuals that are collectively important for migratory bird conservation.*

Response 71: In chapter 1 we recognize the importance of several other plans that address nation wide planning efforts and objectives for migratory wildlife species.

Comment 72: *There is no mention of the "2008 Pacific Flyway Management Plan for the Rocky Mountain Population of Trumpeter Swans," the North American Waterfowl Management Plan, the Intermountain West Joint Venture, or the wildlife action plans in the Tri-State area.*

Response 72: See chapter 1 for a description of these plans.

Comment 73: *There appears to have been little or no coordination even with other programs within the FWS.*

Response 73: Refer to the participant list in this appendix. There was extensive collaboration with state and other federal partners.

INVASIVE SPECIES

Comment 74: *The discussion of invasive weeds is inadequate. The primary species mentioned are Kentucky bluegrass and other nonspecified nonnative rhizomatous grasses. Are there no state listed noxious weeds present on the refuge? If there are, how are they controlled? This lack of specificity should be replaced with concise detection and control practices with as much detail as possible.*

Response 74: There is considerable discussion on invasive species and a commitment for control and eradication. This is a broad management document. A 5 year step-down Integrated Pest Management Plan will be completed, providing greater detail on specific species and treatments.

Comment 75: *By reducing/destroying the brome grass, you are also destroying part of history. Early settlers toiled and labored intensely to farm and establish these areas. Management has yet to prove they have found an optimal way of reducing it.*

Response 75: We agree that it is difficult to control this species, nevertheless, the Service is required by policy to control invasive species, including brome grass. This grass outcompetes more desirable native plants that have a greater benefit to a variety of wildlife species, both nutritionally and structurally.

The refuge will not be able to eradicate smooth brome. Viable methods of control will be developed for this high mountain valley. Potential goals would be to contain the spread of satellite populations into native vegetation and to reduce the cover of brome within formerly plowed areas while reseeding native plants.

OTHER WILDLIFE

Comment 76: *Alternative A contains no population size of the potential species affected, nor do the other alternatives. The word 'management' implies the need to specify numbers in proposing changes.*

Response 76: It is difficult to accurately predict how migratory populations of wildlife within the boundaries of a 49,000 acre refuge boundary will respond to management actions. Outside influences, such as impacts to surrounding habitats, climate change, and changes in land use all affect populations on the refuge, regardless of how well the refuge is managed. Monitoring wildlife response to management actions often requires a broader, landscape perspective. To do this, the CCP supports, and works toward habitat objectives, outlined in landscape level plans such as the "North American Waterfowl Management Plan" and "Pacific Flyway Management Plan for the Rocky Mountain Population of Trumpeter Swans."

Comment 77: *The CCP provides no discussion of how the refuge will support resident grizzly bear, wolverine, and wolves other than a discussion on predateding wolves.*

Response 77: These wildlife species use the refuge infrequently; however, more detail will be provided in a step-down habitat and wildlife management plan.

Comment 78: *The refuge hosts substantial seasonal use by antelope, elk, and moose but does not discuss how that use fits into the larger landscape of adjoining lands in the Centennial Valley, southwestern Montana or southeastern Idaho.*

Response 78: These are state managed species and we will continue to manage them in coordination with the state.

Comment 79: *How are seasonal concentrations of big game on the refuge influenced by human activities and habitat conditions elsewhere?*

Response 79: Hunting on surrounding lands has created concentrations of elk in refuge no-hunting areas in the fall. This impacts refuge habitats and is counterproductive to the state's objective of reducing the number of elk residing in the valley.

Comment 80: *The key to successful preservation of wilderness values, and in managing surrounding landscapes to help preserve that character, is for*

management to exercise restraint and to minimize physical facilities, motorized travel, and avoid increasing human disturbance in areas where wildlife finds security.

Response 80: We agree and this CCP minimizes motorized access and development of facilities for the majority of the refuge, in particular Red Rock Lakes Wilderness, which makes up 66% of the refuge.

Comment 81: *We assume species of conservation concern will receive more attention than other species. This needs to be spelled out more clearly in this document.*

Response 81: This CCP identifies several target species, many of which are species of concern in Montana, which the Service will use to manage habitat and gauge response.

Comment 82: *Due to the close proximity to the St. Anthony Sand Dunes it is probable that the St. Anthony Dune Tiger Beetle (*Cicindela arenicola*) occurs on Red Rock Lakes National Wildlife Refuge. It is listed as G1/G2 (highly imperiled/imperiled) status by NatureServe. You may wish to consider this in your priority setting and subsequent management plan.*

Response 82: This beetle has not been documented on the refuge.

Comment 83: *Numerical survey data for both the Brewer's sparrow and swan document numbers that exceed threshold values to classify the refuge as IBA. Although the trumpeter swan information is contained on page 86 (draft CCP), the Brewer's sparrow information is missing. (p 101 EC) (draft CCP)*

Response 83: BirdLife International recently down-listed Brewer's sparrow so it is no longer a high-priority species for IBAs. They are therefore no longer considered for IBA recognition at the contiguous or global scale. They are still a species of concern at the state level, but we are unaware of threshold values for state IBAs.

Comment 84: *The plan should evaluate existing endangered and candidate species on the refuge and outline a management plan that will ensure the health and recovery of these populations.*

Response 84: Currently there are no threatened or endangered species using this refuge on a regular basis.

Comment 85: *Focus on restoring native and migratory wildlife species within or near Red Rock Lakes currently in decline, including Arctic grayling, Westslope cutthroat trout, and bighorn sheep.*

Response 85: There are no bighorn sheep on the refuge and we have addressed these fish species.

Comment 86: *Employ only nonlethal means to prevent and resolve livestock conflicts with wolves and other predatory wildlife.*

Response 86: If at all possible, nonlethal means will be used to resolve livestock conflicts. Language has been added to this strategy in chapter 4.

Comment 87: *RRL is one of the few refuges of a significant size to allow bison to recover and thrive. Three-wire high tensile electrified fence would contain bison.*

Response 87: The service has extensive experience with fencing of American bison and three wire high tensile has not been found to be adequate. The Service is not willing to accept periodic escape and the consequences that would result. Secondly, there is significant migration in and out of the refuge by elk, moose, pronghorn, and deer. A bison fence would conflict with that migration. The service will not reintroduce bison that require any significant fencing.

Comment 88: *The refuge should be prepared to host wild migrating bison that may emerge from the Greater Yellowstone area.*

Response 88: If a population does migrate and reside in the valley, the refuge will address this along with other partners in the valley.

Comment 89: *More specifics need to be added to the draft plan. For example the plan states wolves and bison would be managed, but it doesn't say how or at what levels. That leaves important issues such as these open to the theology and philosophies of the manager, and in turn lends to potentially inconsistent practices as managers come and go.*

Response 89: This is a broad management plan. There will be additional specifics in step-down wildlife management plans, available for public review, that will be revised approximately every one to five years.

Comment 90: *I am not in favor of bison on the refuge due to disease impacts to cattle and the need for a fence, impeding wildlife movements.*

Response 90: This CCP does not propose reintroducing fenced bison on to the refuge.

Comment 91: *Wolves have increased beyond established goals. The refuge should not be a safe house for them to return to after they forage out to private lands. Who would issue the special permit for lethal control? This also applies to bears and lions.*

Response 91: The refuge will work with the state and neighboring landowners to address any issues on a case by case basis.

Comment 92: *The plan does not specify a clear management scheme based on refuge history and focal species, including discussions of explicit management practices (step-down tasks for example), temporal aspects of the proposed practices, negative aspects on other focal species, and mitigation measures where necessary.*

Response 92: We feel this CCP provides broad but clear direction for future management. This document also proposes the completion of several step-down management plans, which can be revised every one to five years and will provide additional specifics. The public can review these plans.

Comment 93: *In apparent violation of CCP planning policy, which requires that “At a minimum, each refuge should develop goals for wildlife species or groups of species, habitat (including land protection needs), compatible wildlife-dependent recreation, other mandates (such as refuge-specific legislation, executive orders, special area designations, etc.), and fish, wildlife, and plant populations, as appropriate,” the draft CCP/EA contains no goals or objectives for wildlife species or groups of species.*

Response 93: We feel the draft CCP did meet the intent of the planning policy by explicitly discussing habitat needs of target species of wildlife and how those needs can be met through management actions. The final document was modified to add specific trumpeter swan population objectives from the “Pacific Flyway Management Plan for the Rocky Mountain Population of Trumpeter Swans.” Objectives were also added for moose and Arctic grayling.

GRAZING

Comment 94: *Why are grazing and fire proposed as management tools for arid uplands? Neither is appropriate for arid lands, especially with the loss of sagebrush habitats around the west.*

Response 94: ‘Arid uplands’ in cool regions are generally considered areas that receive less than 10 inches of precipitation annually. The average annual precipitation on the refuge exceeds 20 inches. Yet, due to the well-drained soils of the Centennial Sandhills, these habitats could be considered ‘arid’. This is also why fire and grazing are not commonly used as a tool in the sandhills. The remaining grassland habitats on the refuge did evolve with grazing and fire as a natural disturbance, and the refuge will continue to mimic these processes with management actions.

Comment 95: *Grazing on federal lands is an important issue to our members. There is no mention of how grazing will continue to be authorized and managed on the refuge.*

Response 95: The CCP states that the grazing program will continue. The Service will ensure that the program is prescriptive and supports and promotes the refuge’s habitat management objectives.

Comment 96: *We support the removal of interior fencing on the refuge to eliminate the potential for wildlife impacts, including altering wildlife movements. We ask the USFWS to fully analyze and develop an interior fence inventory on the refuge and analyze what fences need to be removed in the short-term and long-term and what fences can stay on the refuge without impacting wildlife habitat and wildlife movement.*

Response 96: A great number of fences have already been removed. The remaining fences are needed to properly manage the prescriptive grazing program. Most of the remaining fences are now wildlife-friendly; nevertheless, the refuge will continue to reevaluate the fencing program. The refuge is currently mapping all fences and noting their condition and design.

Comment 97: *All livestock grazing should be secondary to the native flora and fauna. The management focus should be on native habitats, not on the livestock aspect. Livestock fencing should accommodate the passage of wildlife.*

Response 97: The refuge has led the implementation of wildlife-friendly fences in the valley and continually utilizes wildlife-friendly designs.

Comment 98: *Simply to “direct” management of livestock grazing “towards” habitat and wildlife objectives is not sufficient to fulfill the Refuge System’s core mission to conserve wildlife first and foremost.*

Response 98: The strategy related to grazing has been modified to reflect this intent of only using prescriptive grazing to benefit wildlife habitat.

Comment 99: *Defenders has extensive experience helping ranchers manage livestock without harming wolves and other predators, and we would welcome the opportunity to help implement these practices on the refuge and/or adjacent lands.*

Response 99: Most of these successes have occurred on smaller landscapes. We have added language to consult with other partners who have successful methods for using nonlethal methods to control wolves preying on cattle.

Comment 100: *The CCP should take steps to increase resource resiliency by working to reduce non-climatic stressors on native wildlife and water resources, such as non-prescriptive livestock grazing.*

Response 100: The CCP does not propose any non-prescriptive grazing.

Comment 101: *Get rid of the cattle grazing on this land owned by national taxpayers, this grazing destroys the place. Let the ranchers rent the land they need from private landholders.*

Response 101: Prescriptive grazing by cattle is used as a habitat management tool to mimic natural disturbances and will not negatively impact habitats, including refuge waters.

Comment 102: *Prescribed fire should be stopped immediately. Fine particulate matter is released with this burning, as well as every chemical deposited on that land.*

Response 102: Prescribed burning is an important management tool that mimics a natural process. Properly used, it can help control invasive species and improve habitat for wildlife, including nesting migratory birds.

Comment 103: *That cattle grazing is allowed in the refuge is a travesty, polluting the streams and injuring ground nesting birds.*

Response 103: The refuge uses grazing as a tool to mimic the ecological services previously provided by bison. Several species of ground nesting birds prefer to nest in grazed areas, including long-billed curlews. Cattle are fenced from most riparian areas and are not typically allowed on the refuge until July 10th, minimizing disturbance to ground nesting birds.

BIODIVERSITY/INTEGRITY

Comment 104: *The CCP significantly redirects the purpose of the refuge, in part, to achieving a high degree of biodiversity; however, that ambiguous term is interpreted. The adoption of biodiversity as a comanagement objective not only dilutes the clear language embedded in the original purpose but tasks the manager with yet another mandatory consideration.*

Response 104: This CCP does not redirect the purposes of this refuge but it does comply with the Service's policy that requires managers to consider natural biodiversity when managing refuge lands. This does not impede the refuge from giving priority to migratory birds, the purpose for which it was established.

Comment 105: *Many of the management practices are conceptual, rather than precisely specified. For example, it states that the sagebrush/Centennial sandhills habitat will 'be managed for biodiversity'. This type of statement is no guidance to future managers and is liable to 'seat of the pants' management rather than well thought best management practices.*

Response 105: This is a broad management plan, which will be followed by detailed step-down plans;

nevertheless, there is ample detail in this document to allow future managers and biologists to be consistent over the next 15 years. It does allow for creativity and innovation as new information and technologies become available.

Comment 106: *I could support additional monitoring if its purpose was to direct management practices but do not see a reason for the refuge system to conduct other types of research. There are plenty of institutions that can and will do that work.*

Response 106: This refuge provides a great outdoor classroom for researchers interested in developing a greater understanding of how this ecosystem functions and how best to protect and restore it. Permitted research is closely monitored and meets refuge objectives and needs.

Comment 107: *This draft CCP/EA inappropriately makes managing for biological integrity, diversity, and environmental health (BIDEH) the primary foundation of the document. The draft is pervaded by the unspoken and unproven philosophy that by managing for the vague concepts of biodiversity, integrity, and natural processes, somehow all wildlife management and conservation needs will be adequately addressed.*

Response 107: We don't disagree that BIDEH serves as one of the foundations of this plan. The U.S. Fish and Wildlife Service has a policy on BIDEH (Service Manual 601 FW 3) that directs refuges to consider the protection of a broad spectrum of fish, wildlife, and habitat resources found on refuges and associated ecosystems. When completing a CCP, we are to determine the appropriate management direction to maintain and, where appropriate, restore biological integrity, diversity, and environmental health, while achieving refuge purposes. We feel this plan has achieved that objective.

Comment 108: *Although biodiversity, integrity and natural processes are the foundation of the draft CCP/EA, the terms "integrity" and "natural processes" are never defined, even though the document includes a six page glossary.*

Response 108: These terms have been added to the glossary.

Comment 109: *The over-emphasis on BIDEH was carried to such an extreme that the Vision Statement includes no mention of managing, conserving, or restoring wildlife populations or of a desired future condition that includes healthy populations of all (or any) native wildlife species. Providing habitat of even the best possible quality is not an adequate future condition without focus on the wildlife.*

Response 109: Vision statements are very broad and typically do not identify population goals for specific wildlife species. These details are found in the goals,

objectives, strategies, and rationale in Chapter 4 of this document.

In addition, the Service has a biological integrity, diversity, and environmental health policy that requires the Service to consider the protection of a broad spectrum of fish, wildlife, and habitat resources found on refuges and associated ecosystems. It also requires that within the comprehensive conservation planning process, the Service should determine the appropriate management direction to maintain and, where appropriate, restore biological integrity, diversity, and environmental health, while achieving refuge purposes.

ROADS, TRAILS, AND FACILITIES

Comment 110: *We strongly opposed the closing of Idlewild Road and the associated boat launch. We enjoy driving this road and it doesn't get a lot of use. The Service should create an interpretive panel that relates the history of this area to the public including the waterfowl hunting history.*

Response 110: Idlewild Road will remain open with certain specifications:

Idlewild Road was built through a wetland site and therefore it will have to be continually maintained. As the road has deteriorated, vehicles have tended to drive off road causing damage to vegetation and compaction of the soil, thereby reducing the movement of water through this wetland site. The existing culvert will have to be replaced.

The refuge will post a sign recommending that only 4-wheel drive or high clearance vehicles utilize the road. The road may be closed at any time due to weather and road conditions.

Comment 111: *The final CCP should address where and how dirt bikes and other ATVs, including snowmobiles, use the refuge and how motorized use impacts wildlife, local landowners, and other refuge visitors.*

Response 111: As in the past, motorized vehicles, such as cars and licensed ATVs, will only be permitted on county roads and refuge roads currently open to vehicle use. This CCP does not expand refuge roads nor allow snowmachine use on refuge roads.

Comment 112: *The plan presents a "pro-development, one-size fits all refuges" concentration on constructing physical facilities and expanding public use, instead of recognizing the intrinsic values of this landscape. This approach is contrary to restoring and maintaining a wilderness character and preserving the powerful legacy this refuge represents.*

Response 112: Critically needed housing for added staff will be completed within the headquarters site on already disturbed ground.

The CCP proposes replacing two unsafe, condemned bridges along an existing road open to the public and an existing foot trail/service road.

Replacing the Red Rock Creek bridge will allow this section of the auto tour route to make a loop. Currently, visitors have to drive in and out the same way which doubles the disturbance to wildlife. This replacement will not impair current stream dynamics. The entire auto tour route will be interpreted with minimal signage and a brochure.

Replacing the failed bridge along the existing Sparrow Pond Trail will provide a safe passage for visitors to view wildlife and staff to access portions of the refuge for management and maintenance. This replacement will not impair current stream dynamics.

Comment 113: *We are concerned about the impacts that unrestrained research activities, as proposed in the proposed action, may have on the refuge's habitats and wildlife.*

Response 113: This document does not propose unrestrained research activities. Research will be permitted if it is found to be compatible and meets refuge data needs, goals, and objectives.

Comment 114: *Apart from its effects on habitat, the plan fails to disclose the costs of the projects it promotes.*

Response 114: It is difficult to predict the costs of all activities over 15 years as costs of materials and labor change over time. This document is used for planning purposes and to set priorities. It does not constitute a firm commitment to provide funding for all proposed actions.

Comment 115: *Plan appears inconsistent in that it promotes construction of bridges and roads that undermine habitat and wildlife use, while allowing existing structures, such as the dam on the Lower Lake that provides habitat management flexibility, to possibly fail from benign neglect.*

Response 115: The refuge roads and bridges already exist and are used by the public—there is no new road construction proposed in this document. Road maintenance is a standard activity on all public land. We will be maintaining the Lower Lake water control structure.

Comment 116: *The east side loop road should be reinstated with a new bridge across Red Rock River.*

Response 116: The east loop road will be repaired and the bridge will be replaced to be part of an interpreted auto tour route.

Comment 117: *While promoting stream function on one hand, on the other hand, the plan also promotes construction of two bridges that will impair stream*

dynamics on two major streams. The sole reason for constructing these bridges is to support new auto tour routes, a paradoxical approach to wildlife viewing especially on a refuge where wildlife can often be seen from existing roadways. However, in this case, by increasing disturbance in sanctuary areas, the auto tour routes themselves displace the very wildlife people come to see.

Response 117: The CCP proposes replacing two condemned bridges along an existing auto tour route and a hiking trail.

The auto tour route will be created along existing roadways currently open to the public, but will be interpreted with minimal signage and will require an existing bridge be replaced. This repair will not impair current stream dynamics.

The remaining bridge is an existing structure in need of replacement to allow Service staff to access portions of the refuge for management and maintenance. The public also uses this as a walking trail to view wildlife.

Comment 118: *Money will be saved in building costs by maintaining the current level of staff.*

Response 118: There has been no new refuge housing and limited staff additions for almost 50 years. Achieving the refuge vision and goals will take more than money, it will require added staff. A lack of housing in the remote valley has been a constant hindrance to expanding refuge programs and developing a greater understanding of how to best conserve, restore, and manage refuge resources.

Comment 119: *Two campgrounds are well maintained and consistently used by visitors to the area. Changes to the current refuge maintenance plan would be counter-productive.*

Response 119: The refuge campgrounds will continue to be minimally maintained, but routine maintenance is always needed to retain existing facilities, while some upgrades will be needed to provide access to physically challenged visitors.

Comment 120: *The area along Odell Creek between the county road and Sparrow Pond should be open to non-motorized access for hunting and fishing (in accordance with state regulations).*

Response 120: Odell Creek is already open for fishing. The described area has never allowed motorized vehicles. The area to the north of Odell Creek is proposed to be open to big game hunting. The area from the county road north to Odell Creek is closed to hunting to protect buildings, residents, and visitors in the Lakeview area. Please see the public use map (figure 14).

Comment 121: *The road which leads from the county road to the airstrip should be open for motorized*

access for hunting and wildlife viewing from July 1 to November or December, for people who exhibit a state-issued disability license.

Response 121: The proposed action did include making the Sparrow Pond Trail, pulloffs, signs, campsites, toilets, and kiosks accessible. The state makes provisions for disabled hunters to shoot from vehicles and the individual can work with the refuge to be accommodated.

Comment 122: *Needs more trails and access to view the birds (waterfowl and non) and critters (especially moose). Not everyone can hike over rough ground to reach the water's edge. Moreover viewing platforms would be very helpful.*

Response 122: There are three roads leading to the shore of Lower Red Rock Lake to view birds. Upper Lake has a boat launch leading to the edge of the lake. Viewing the refuge from county roads provides excellent opportunities to see waterfowl, moose, deer, sandhill cranes, coyotes, and sometimes a wolf. The CCP proposes to work with the county to provide accessible pulloffs so visitors can safely get out of the way of traffic. Public access trails exist to Sparrow Pond and Slough, and up Odell Creek. In keeping with wilderness designation, no new trails or structures are allowed to be built within the wilderness boundary. The eastern ponds are also open to the public for wildlife viewing with easy walking access to the water's edge in many places.

Comment 123: *I believe what access there is, should be closed (with the exception of Red Rock Road). All viewing of animals could be done by spotting scope from the main road, leaving the animals to roam free and wild without becoming habituated to human presence.*

Response 123: The majority of the refuge is road and trail free, particularly the wilderness area, which encompasses 66% of Red Rock Lakes Wilderness. The document does not propose any additional roads or trails.

Comment 124: *There was no mention to reopen the old loop road at the east side of the refuge by replacing the old bridge.*

Response 124: Creating an auto tour route along this loop road (and other roads) is included as a strategy in this final CCP. Red Rock Creek bridge will need to be replaced as part of this auto tour route.

Comment 125: *There is a proposal to close Lower Lake campground, an ill thought out plan in light of the road that has just been rehabbed.*

Response 125: This proposal was in alternative D, not the proposed action. Both campgrounds will remain open to the public.

Comment 126: *The proposal of keeping the refuge roads open all year will cost taxpayers a lot of money. It is also important to let the wildlife have a break from human contact.*

Response 126: The proposed action did not propose keeping the refuge roads open all winter. This is cost prohibitive and is probably impossible to achieve, given the amount of snowfall.

Comment 127: *Encourage the county to increase their maintenance of refuge roads.*

Response 127: The refuge has consistently worked with the county to maintain the county roads but we do recognize that this is a remote part of Montana, with a small population, and road maintenance dollars are limited.

Comment 128: *Those who enjoy the auto tour route early in the year are likely to end up stuck on either Elk Lake or North Centennial Road.*

Response 128: Any visitor to the Centennial Valley should take precautions and ensure they are aware of road conditions in this remote valley. These two roads are county roads and maintained by the county. The refuge will continue to encourage the county to adequately maintain these roads during high visitation periods but this depends on their available staff and resources.

Comment 129: *Do not allow over-snow vehicles on the auto tour route after December 2. This area will provide ideal cross-country skiing.*

Response 129: The entire refuge is closed to snowmobile use (except for the county roads) but open to cross country skiing.

Comment 130: *I did not find fencing directly addressed in any alternative. Much of the fencing is non-wildlife friendly and should be replaced.*

Response 130: Most of the refuge fencing is designed to be wildlife-friendly.

Comment 131: *Signage is important. It helps people better understand the assets available and the boundaries. Many tourists travel onto private land.*

Response 131: We agree and have proposed a balance between orienting visitors and maintaining the wilderness characteristics of the refuge through minimal signage.

Comment 132: *Given the massive economic problems and federal deficits, the projected staff and housing increases required for implementation of alternative B may have become unrealistic.*

Response 132: This CCP provides long-term guidance for management decisions. This document does state that these plans are often substantially above current

budget allocations, and are therefore primarily for Service strategic planning and program prioritization purposes. They do not constitute a commitment for additional funding. If funding does become available for the refuge system, this CCP will ensure these additional funds are spent responsibly and on the highest priorities.

VISITOR SERVICES PROGRAMS

Comment 133: *The plan appears too narrowly focused on expanding public use at the expense of habitat, wildlife and wilderness values.*

Response 133: The need for improving visitor service facilities are to better orient and welcome visitors. All of the projects will take place along existing trails and roads. These projects will not in and of themselves expand public use at the refuge, but will better educate the public about this unique and special refuge and its wildlife.

Comment 134: *The goal of providing environmental education to people in their car could be easily accomplished by a low power AM broadcast station similar to that used in numerous parks at a fraction of the cost and without adverse impacts to refuge wildlife.*

Response 134: Given the level of visitation, brochures and limited interpretive panels should be sufficient to provide adequate visitor information.

Comment 135: *Maintaining the aspen groves should be accomplished without harming wildlife. I've observed the drought as having the bigger impact. Expanding hunting is not acceptable.*

Response 135: Elk are a state managed species. The state has population and harvest objectives for southwestern Montana. The refuge is not an elk refuge and the concentration of elk in closed areas during hunting season is not only harming refuge habitats, but prevents the state from achieving its population and habitat goals.

Comment 136: *The plan indicates that opening of the interior of the refuge to hunting will minimize "damage" done by concentrations of big game. Relying on willow browsing alone does not consider the fact that consumption by ungulates is a primary use for willow. Where elk are concerned, it is difficult to see what damage they are causing considering the refuge hosts a livestock grazing program and that the interior of the refuge, an area to be opened to hunting, has ample grass.*

Response 136: Our concern related to elk populations is primarily related to aspen regeneration. Aspen stands in the Centennial Mountains, including the refuge, are predominantly comprised of older age-class trees, suggesting that recruitment of young aspen has not occurred for several decades. Recent

landscape-scale disturbances (wildfire) have resulted in considerable suckering of aspen in the Centennial Mountains. However, data suggest that most of these suckers do not get above browse height due to overbrowsing by elk. This impacts a host of other species, including nesting songbirds. Lastly, the major riparian areas on the refuge are fenced to exclude cattle, so measured impacts of browse in these areas is due to native browsers.

Comment 137: *The plan does not state how much area will be opened to hunting. The plan needs to assess the adverse impacts caused to winter survival of big game such as moose, caused by these animals being chased back and forth across the refuge.*

Response 137: Over 60% of the refuge will be open to some form of hunting, including the area open only for moose hunting. Most of the hunting areas are roadless. Over 35% of the refuge is closed to all hunting, but is available for other public uses such as wildlife viewing and photography. The hunting areas are also open to these non-hunting uses.

Moose hunting is only allowed in the southeast corner of the refuge. We do not foresee any impacts to moose from opening areas to other hunting. Other willow habitat closed to hunting offers excellent opportunities for the public to view moose year-round.

Wintering moose populations have increased at an annual average rate of 2.4% (SE = 0.06) for the past 40 years. This growth occurred concurrent with regulated harvest. We work closely with the State of Montana to monitor the population and habitat conditions.

Comment 138: *Animals that once were viewable to the public will be displaced by hunting and hunting will go from a quality experience to a killing field where big game is encircled by vehicles and shot as they congregate.*

Response 138: Hunting only occurs during a portion of the year allowing for ample viewing opportunities for the majority of visitors.

Due to the lack of roads within Red Rock Lakes Wilderness, elk can not be surrounded as they move into the timber and more secure hiding cover. We will closely monitor hunters for any illegal activities during hunting season.

Comment 139: *Refuge legislation weighs priority public uses equally, thus Service personnel have an ethical responsibility to set aside their biases, be objective, and consider non-hunting uses on the same par as they might hunting.*

Response 139: Waterfowl hunting is limited to approximately 1 month each year on a limited area (approximately 8% of huntable habitat) of the refuge. Additionally, portions of the refuge were acquired

with monies obtained through the purchase of federal migratory bird hunting stamps by waterfowlers. Use of these monies to purchase lands mandates that waterfowl hunting be allowed on no more than 40% of the area.

Big game hunting is a tool to manage ungulate populations. Numbers of elk within the hunt area are much higher than state population objectives. The elk herd in southwestern Montana has doubled in the last 2 decades. Habitats throughout the area are also being impacted. The expanded area that is being opened to hunting is where elk are congregating in large numbers.

The refuge provides the same access to non-hunting individuals within hunt areas. The refuge also provides approximately 17,826 acres where hunting is not allowed.

Comment 140: *Does the refuge respond to inquiries from the hundreds of school children and classrooms that write asking about swans? Has it incorporated overall environmental education into the existing popularity of trumpeter swans?*

Response 140: The refuge responds to school children irrespective of the content of their inquiries. Additionally, the refuge's environmental education program will incorporate information on swans and other migratory birds and resident wildlife that utilize the refuge through the development of a swan poster and website.

Comment 141: *Why are only areas east of Upper Lake open to moose hunting given concern over woody browse utilization. Open more of the refuge (possibly westward of Odell Creek)? If the permit numbers remain the same, it would better disperse hunters.*

Response 141: The current moose hunting area encompasses the majority of riparian habitat utilized by wintering moose on the refuge.

Concentrating moose hunters in an exclusive, designated area allows for a quality hunting experience (no competition with other hunters) and assists in law enforcement efforts.

Comment 142: *Expansion of big-game hunting should not be permitted in areas that have been set aside as fall waterfowl feeding sanctuaries. The location of fall sanctuary feeding areas for swans and other waterfowl should be clearly portrayed on refuge use maps.*

Response 142: We have not proposed opening any refuge waters that have traditionally been set aside as waterfowl sanctuaries. The final maps do depict most of the lakes on the refuge as closed to hunting. This is specifically to provide this sanctuary for trumpeter swans and other waterfowl.

Comment 143: *Fishing throughout the refuge should be limited to single-hook lures. There are some monster grayling in Red Rock Creek which are vulnerable to treble-hook lures. Red Rock Creek, along with the Culver, Widgeon and McDonald Ponds, should be considered for catch-and-release regulations.*

If Yellowstone National Park permits catch and release, single barb-less hooks, artificial flies only, why can't the RRLNWR?

Response 143: We are continually looking for ways to reduce impacts to Arctic grayling but don't believe that instituting this restriction would be worth the added complexity to the refuge's fishing program. One tool to reduce impacts to grayling populations is for anglers to keep the nonnative fish that are caught in accordance to state regulations.

Comment 144: *Last year we submitted a request to increase fishing access in the refuge and that is not in the CCP. The three creeks and three ponds in which fishing is currently permitted do not hold many fish, making them unattractive for fishermen. The larger lakes, Upper and Lower Red Rock Lakes, for example, are the ones that are of most interest and there is no provision in the plan for opening them to fishing.*

I would have liked to have seen a short period of time in the season allocated to fly-fishing in the lakes.

Response 144: Red Rock Lakes NWR was established to protect primarily migratory birds. Upper and Lower Red Rock Lakes are extremely important to waterbirds during breeding and migration. The refuge hosts tens of thousands of migrating waterfowl before freeze-up each fall. Allowing fishing was not considered because the refuge believes that the increased use of the lakes from anglers would have a detrimental impact to resting and feeding migratory birds, including the thousands of swans (trumpeter and tundra) that refuel here. Some additional streams will be opened to fishing access (see figure 14).

Comment 145: *The lakes don't need motorized craft (electric motors should not be permitted) but kayaks, canoes, float tubes, pontoon boats should all be permitted.*

Response 145: Non-motorized boats such as canoes and kayaks are already permitted on Upper and Lower Red Rock lakes, River Marsh, and Red Rock Creek. Motorized craft have not been permitted on the lakes for years, with the exception of the area below the WCS on Lower Red Rock Lake.

There is no boating or floating allowed on the eastern ponds.

Comment 146: *I am disappointed, but not surprised to see the complete absence of environmental*

education from the proposed action. That seems like a shame.

Response 146: Objectives and strategies have been added to the document to accommodate limited environmental education programs.

Comment 147: *There is a notable absence of discussion on accessible trails until the facilities section. This should be a bit more specific.*

Response 147: Language describing accessible trails has been added to the final document.

Comment 148: *In the previous draft there is much more specific language about what will be provided in terms of accessible facilities. Why was this removed? Most could be added without detracting from the wilderness aspect of the refuge.*

Response 148: We have added back the language that describes proposed accessible facilities.

Comment 149: *Wouldn't there be conflicts between anglers and hunters? Would you allow fishing in hunting areas during hunting season?*

Response 149: Yes, there could be conflicts but fishing during hunting season is minimal so there should be few conflicts.

Comment 150: *In alternate C, Tom Creek and MacDonald ponds would be opened to fishing on June 15 in an area that isn't open until July 15. Please clarify.*

Response 150: The proposed action, alternative B, lists these areas as open according to state seasons.

Comment 151: *All of the waters discussed should be shown on the public use map.*

Response 151: We try to keep the maps uncluttered, but we agree with this comment and have identified waters discussed on the maps in the final CCP (see figure 14).

Comment 152: *Offer upland game and webless migratory bird game hunting opportunities under state regulations on lands open to big game hunting.*

Response 152: There were no requests during public scoping to open upland game bird hunting on the refuge. Nevertheless, this would be a new hunting opportunity for a new species of wildlife and according to Service policy would require full public participation and the preparation of a separate hunt plan. The Service may pursue this opportunity in the future and will be involving the state and the public in the evaluation.

Comment 153: *Reinstate walk-in waterfowl hunting opportunities along Odell Creek and Sparrow Slough and Pond.*

Response 153: The refuge already provides considerable opportunities for waterfowl hunting. This final document also proposes keeping Idlewild Road open rather than closing it, a part of the original proposed action in the draft CCP. This road will continue to facilitate waterfowl hunting on the west end of the refuge, including opportunities to walk in.

Comment 154: *It would be easier to follow if all references to trails were under one section.*

Response 154: The more specific trail projects are within respective strategies and are more generally mentioned within the facilities objective.

Comment 155: *All discussion on accessible trails and blinds have been removed. Why? The Service must provide the same opportunities for all visitors. There are opportunities for creating accessible trails in areas not designated as wilderness.*

Response 155: We added language to the strategies identifying a blind below Lower Lake water control structure, an accessible trail at Sparrow Pond, and vehicle pulloffs along county roads.

Comment 156: *Expanding big game hunting is not compatible with the purposes for which the refuge was established. Verified data are lacking on the biological impacts of this expansion.*

Response 156: Hunting is a legitimate and compatible use of this refuge. This refuge was not established as an elk preserve, where hunting is prohibited. The Service feels the analysis of expanding the existing hunting program was sufficient, which found the expanded big game hunting compatible with refuge purposes.

Comment 157: *The Service must ensure that sufficient funds are available before it approves a plan to expand hunting, considering the economic impacts to the refuge and surrounding businesses as a result of decreases in use by non-consumptive users during hunting season.*

Response 157: As outlined in the compatibility determination, the Service will ensure that the necessary resources, which should be minimal, are available prior to opening this expanded hunting area. This refuge is located in one of the most remote valleys in Montana. Most of the refuge is surrounded by open ranch land and very few businesses exist. Of the nearby businesses, many are dependent upon hunters' dollars to sustain profitability. Therefore, expanded hunting would most likely positively benefit local businesses. Moreover, most non-consumptive users frequent the refuge and surrounding area during the summer, when hunting seasons are not open.

Comment 158: *We propose that expanding hunting [at] Red Rock Lakes is a significant action and*

requires the preparation of an EIS—citing public safety, unique characteristics of the area, endangered and threatened species, or involving highly uncertain or unique or unknown risks.

Response 158: The preferred alternative, including the proposal to expand the current hunting program, is not a major federal action that would significantly affect the quality of the human environment within the meaning of Section 102(2)C of the National Environmental Policy Act of 1969. Accordingly, the preparation of an Environmental Impact Statement is not warranted. Hunting has occurred on this refuge for decades and has been found to be compatible. This expansion will assist the refuge in achieving its management objective of reducing browsing pressure on aspen habitats. These habitats are important to various migratory birds that use the refuge, the purpose for which this refuge was established. The state has determined that the elk population in this valley exceeds established goals. Harboring of elk on the refuge may exacerbate this issue, thereby contributing to habitat damage not only to the refuge, but to the surrounding valley habitats.

There are no known threatened or endangered species that inhabit the refuge.

Comment 159: *The impacts of expanded hunting on the experience and potential socioeconomic contribution of these non-consumptive users must be properly taken into account—including being injured or killed by a bullet or having one's dog or horse killed, or seeing a wounded animal.*

Response 159: This is a very remote refuge and non-hunting visitors are very seasonal (mostly summer only, when the roads are most passable), which rarely overlaps with the hunting seasons. Visitors are allowed to travel all public use areas during the hunting season, but a vast area on the east end of the refuge, which includes an auto tour route for viewing wildlife, is closed to all hunting activities year-round providing an exclusive use area for these visitors.

Comment 160: *The interpretation proposal is bold. We support the proposed action outlined in the CCP, but caution the refuge staff about doing too much with interpretation. Additional signage and kiosks at Lower Lake Road, Red Rock Creek and at the northwest corner entrance might take away from the rustic nature of the refuge. Providing information at the headquarters in one central location might lessen the impacts on a visitor's wilderness experience.*

Response 160: Interpretation programs allow for visitors to orient themselves while creating a greater understanding of the refuge and its resources. To reduce impacts to the wilderness setting, the existing deteriorating kiosks and panels will be replaced at their respective locations. One new one will be built at the entrance of Lower Lake Road. Interpreting

habitat and wildlife along the auto-route may be a combination of low-mounted signs and a brochure. Not all people will use a brochure or have access to one but will readily stop at interpretive panels.

Comment 161: *None of your proposals take into consideration the purpose and nature of our new environmental center. It is extremely important that any future planning must take into careful consideration the educational activities and public programs that we are now planning and which will incorporate much of the refuge.*

Response 161: At the time of preparing this document, there were no proposals or information provided to the refuge on the plans for these structures in Lakeview being used as an environmental education center; nevertheless this document does support environmental education and interpretation activities that will meet Service objectives. Environmental education partnership opportunities that support the refuge's environmental education objectives outlined in this CCP and the future Visitor Services Plan will be embraced with available, but limited refuge resources, as appropriate.

Comment 162: *Many of your proposals are inappropriate and inconsistent with the official objectives and purposes for which the refuge was established. None of the proposals appear to put wildlife first—including opening the entire refuge to hunting. This decries the entire purpose for which the refuge was established.*

Response 162: The Service does not permit any activity to occur on a refuge that is not compatible with the purposes for which it was established. This refuge was not established to prevent hunting of wildlife. Hunting is a legitimate and traditional public use that has been found compatible on this and most wildlife refuges in the nation. The 1997 National Wildlife Refuge System Improvement Act lists hunting as one of the six priority public uses that we are to consider allowing on refuges. Hunting is not open on the entire refuge.

Comment 163: *There are few schools in this remote area—offering expanded environmental education kits and web site availability to teachers seems unnecessary.*

Response 163: We agree that environmental education, particularly at the surrounding schools, should be minimal. The refuge does host over 12,000 visitors annually, most in the summer months when school is out. Some of these visitors are children and the refuge has missed opportunities to educate these future refuge users on why the refuge is there and why it is important to ensure it remains through their lifetime and for use by their own children. Tools such as interactive websites allow schools across the nation to learn about this refuge and the National Wildlife Refuge System.

Comment 164: Expanding hunting areas will only allow unethical hunting, meaning flock shooting at long range. I am not opposed to hunting.

Response 164: The refuge is also concerned about the impacts of hunting in open areas throughout the refuge, and will work with the state to determine what the best methods for promoting an ethical, quality hunt. The refuge may set limitations on this expanded big game hunting area including initially limiting the number of hunters that can hunt this area at one time. After coordinating with the state and refuge law enforcement, this and other restrictions may be placed on hunting to ensure it is conducted safely and ethically.

The refuge will continue to work to provide law enforcement presence during the hunting seasons.

Comment 165: *Allowing Montana Fish, Wildlife and Parks to set the season and quota for moose hunting is a mistake.*

Response 165: Moose are a state-managed species. The refuge has a long partnership with the state in monitoring the population on the refuge and in the valley. According to survey data and browse studies, moose populations are healthy and can sustain this annual limited harvest, such as the current eleven permits issued for this hunting unit. To provide viewing opportunities, the length of the moose hunting season on the refuge will remain shorter than the state season for HD334. This may change in the future to meet management and harvesting objectives.

Comment 166: *Opening upland game bird hunting would not be appropriate. Visitors get a lot of pleasure out of seeing a 'few chickens'. All of the surrounding public lands are open to grouse hunting. Now that a few sage grouse are appearing, why risk their safety?*

Response 166: This final CCP does not propose opening upland game bird hunting.

Comment 167: *Sometimes families who camp at the Upper Lake ride bike and hike on the roads in this part of the refuge. Opening this area to fishing and other access (but not waterfowl hunting) from July 1 until December 1 would provide opportunities for people with disabilities to fish and view wildlife.*

Response 167: Wildlife viewing is allowed year-round on the refuge. The campgrounds are open year-round but are only maintained until the roads close due to winter weather. Fishing on Upper Lake and Lower Lake is not compatible due to disturbances to swans and other waterfowl.

Comment 168: *I would recommend a five-year trial period to allow fishing in the Upper and Lower Lakes.*

Response 168: Fishing on Upper Lake and Lower Lake is not compatible due to disturbances to swans and other waterfowl.

Comment 169: *The moose season should be closed to maintain ponds and “birding” road access. A wildlife refuge should be a refuge, not for semi-private hunting clubs.*

Response 169: Moose hunting is limited to a small portion of the refuge and is a limited (approximately eleven permits) state-managed hunt. The majority of the refuge is open to wildlife photography and observation, particularly in the summer, when most refuge visitors come to the valley. In addition, this final CCP proposes upgrading a current public road on the east end of the refuge providing interpretation of the various refuge habitats. This would be located in a large area closed to all hunting.

Comment 170: *One very important thing missing from “Appendix A—Key Legislation and Policies” is the 2007 Executive Order: Facilitation of Hunting Heritage and Wildlife Conservation. President Bush recognized the importance of our hunting heritage and he signed this executive order to make sure that hunting opportunities were expanded and enhanced on public lands (including Red Rock Lakes National Wildlife Refuge).*

Response 170: This was added to the final document.

Comment 171: *I understand the issue of ungulates retreating to refugia and increasing their impact there, but think extending the season to match state regulations, plus opening up the whole refuge will unduly increase impacts to the moose population. There is some question regarding the migratory ecology of the moose herd that winters in the refuge, and I would propose more monitoring and research to determine where the moose go for summer range, and whether there is a non-migratory local population mixed with a migratory population.*

Response 171: The refuge works closely with Montana Fish, Wildlife and Parks on moose management on, and surrounding, the refuge. Surveys have shown a steady increase in the moose population on the refuge, indicating that current harvest levels are sustainable.

Comment 172: *Everyone wanted to reduce big game hunting. This is obscene and flies in the face of what the refuge system was set up for.*

Response 172: There was support for not only maintaining, but expanding big game hunting on the refuge. The refuge system, including Red Rock Lakes National Wildlife Refuge, was not established to prevent all hunting. The laws governing the refuge system state that hunting has been identified as one of the six priority public uses for the national wildlife refuge system. Hunting is a traditional use on the refuge and has been found compatible with the purposes for which it was established.

GENERAL COMMENTS

Comment 173: *I believe it was a mistake not to include area landowners in the planning process.*

Response 173: The public, including landowners, was invited to all public meetings and asked to provide written comments. Three public meetings were held at the start of this planning process, and two when the draft plan was released. The public was also given an additional 30 days to review this plan, for a total of 60 days. All comments, including those on the draft CCP and EA, were considered throughout the planning process and resulted in numerous modifications to this final CCP.

Comment 174: *We do not agree with the concept of our property being taken from us by a government entity in the draft CCP.*

Response 174: In no way does this plan propose taking any land from any private landowner.

Appendix B

Key Legislation and Policies

This appendix briefly describes the guidance for the National Wildlife Refuge System and other policies and key legislation that guide the management of Red Rock Lakes National Wildlife Refuge.

NATIONAL WILDLIFE REFUGE SYSTEM

The mission of the Refuge System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans. (National Wildlife Refuge System Improvement Act of 1997)

GOALS

- To fulfill our statutory duty to achieve refuge purpose(s) and further the Refuge System mission.
- Conserve, restore where appropriate, and enhance all species of fish, wildlife, and plants that are endangered or threatened with becoming endangered.
- Perpetuate migratory bird, inter-jurisdictional fish, and marine mammal populations.
- Conserve a diversity of fish, wildlife, and plants.
- Conserve and restore, where appropriate, representative ecosystems of the United States, including the ecological processes characteristic of those ecosystems.
- To foster understanding and instill appreciation of fish, wildlife, and plants and their conservation, by providing the public with safe, high-quality, and compatible wildlife-dependent public use. Such use includes hunting, fishing, wildlife observation and photography, and environmental education and interpretation.

GUIDING PRINCIPLES

There are four guiding principles for management and general public use of the Refuge System established by Executive Order 12996 (1996):

- **Public Use**—The Refuge System provides important opportunities for compatible wildlife-dependent recreational activities involving

hunting, fishing, wildlife observation and photography, and environmental education and interpretation.

- **Habitat**—Fish and wildlife will not prosper without high-quality habitat and without fish and wildlife, traditional uses of refuges cannot be sustained. The Refuge System will continue to conserve and enhance the quality and diversity of fish and wildlife habitat within refuges.
- **Partnerships**—America’s sportsmen and women were the first partners who insisted on protecting valuable wildlife habitat within wildlife refuges. Conservation partnerships with other federal agencies, state agencies, tribes, organizations, industry, and the general public can make significant contributions to the growth and management of the Refuge System.
- **Public Involvement**—The public should be given a full and open opportunity to participate in decisions regarding acquisition and management of our national wildlife refuges.

LEGAL AND POLICY GUIDANCE

Management actions on national wildlife refuges are circumscribed by many mandates including laws and executive orders. Regulations that affect refuge management the most are listed below.

American Indian Religious Freedom Act

(1978)—Directs agencies to consult with native traditional religious leaders to determine appropriate policy changes necessary to protect and preserve Native American religious cultural rights and practices.

Americans with Disabilities Act (1992)—Prohibits discrimination in public accommodations and services.

Antiquities Act (1906)—Authorizes the scientific investigation of antiquities on federal land and provides penalties for unauthorized removal of objects taken or collected without a permit.

Archaeological and Historic Preservation Act

(1974)—Directs the preservation of historic and archaeological data in federal construction projects.

Archaeological Resources Protection Act (1979), as amended—Protects materials of archaeological

interest from unauthorized removal or destruction and requires federal managers to develop plans and schedules to locate archaeological resources.

Architectural Barriers Act (1968)—Requires federally owned, leased, or funded buildings and facilities to be accessible to persons with disabilities.

Clean Water Act (1977)—Requires consultation with the U.S. Army Corps of Engineers (404 permits) for major wetland modifications.

Dingell-Johnson Act (1950)—Authorizes the Secretary of the Interior to provide financial assistance for state fish restoration and management plans and projects. It is financed by excise taxes paid by manufacturers of rods, reels, and other fishing tackle. It is also known as the Federal Aid in Sport Fish Restoration Act.

Emergency Wetlands Resources Act (1986)—Promotes wetland conservation for the public benefit to help fulfill international obligations in various migratory bird treaties and conventions. The act authorizes the purchase of wetlands from Land and Water Conservation Fund monies.

Endangered Species Act (1973)—Requires all federal agencies to carry out programs for the conservation of endangered and threatened species.

Executive Order No. 7023 (1935)—Establishes Red Rock Lakes National Wildlife Refuge “as a refuge and breeding ground for birds.”

Executive Order 11988 (1977)—Requires federal agencies to provide leadership and take action to reduce the risk of flood loss, minimize the impact of floods on human safety, and preserve the natural and beneficial values served by the floodplains.

Executive Order 12996, Management and General Public Use of the National Wildlife Refuge System (1996)—Defines the mission, purpose, and priority public uses of the National Wildlife Refuge System. It also presents four principles to guide management of the Refuge System.

Executive Order 13007, Indian Sacred Sites (1996)—Directs federal land management agencies to accommodate access to and ceremonial uses of Indian sacred sites by Indian religious practitioners, avoid adversely affecting the physical integrity of such sacred sites, and where appropriate, maintain the confidentiality of sacred sites.

Executive Order 13443, Facilitation of Hunting Heritage and Wildlife Conservation (2007)—Directs federal agencies that have programs and activities that have a measurable effect on public land management, outdoor recreation, and wildlife management, including the Department of the Interior and the Department of Agriculture, to facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

Federal Noxious Weed Act (1990)—Requires the use of integrated management systems to control or contain undesirable plant species and an interdisciplinary approach with the cooperation of other federal and state agencies.

Federal Records Act (1950)—Requires the preservation of evidence of the government’s organization, functions, policies, decisions, operations, and activities, as well as basic historical and other information.

Federal Reserved Water Right (1999)—This compact, entered into by the state of Montana and the U.S. Fish and Wildlife Service, settles the reserved water rights for Red Rock Lakes National Wildlife Refuge. The settlement has been ratified by the Montana legislature and approved by appropriate federal agencies and the Montana Water Court.

Fish and Wildlife Act (1956)—Directs the Secretary of the Interior to develop the policies and procedures necessary for carrying out fish and wildlife laws and to research and report on fish and wildlife matters. The act establishes the U.S. Fish and Wildlife Service within the Department of the Interior, as well as the positions of Assistant Secretary for Fish and Wildlife and Director of the Service.

Fish and Wildlife Coordination Act (1958)—Allows the U.S. Fish and Wildlife Service to enter into agreements with private landowners for wildlife management purposes.

Migratory Bird Conservation Act (1929)—Establishes procedures for acquisition by purchase, rental, or gifts of areas approved by the Migratory Bird Conservation Commission.

Migratory Bird Hunting and Conservation Stamp Act (1934)—Authorizes the opening of part of a refuge to waterfowl hunting.

Migratory Bird Treaty Act (1918)—Designates the protection of migratory birds as a federal responsibility; and enables the setting of seasons and other regulations, including the closing of areas, federal or nonfederal, to the hunting of migratory birds.

National Environmental Policy Act (1969)—Requires all agencies, including the Service, to examine the environmental impacts of their actions, incorporate environmental information, and use public participation in the planning and implementation of all actions. Federal agencies must integrate this act with other planning requirements, and prepare appropriate documents to facilitate better environmental decision making. (From the Code of Federal Regulations (CFR), 40 CFR 1500)

National Historic Preservation Act (1966), as amended—Establishes as policy that the federal government is to provide leadership in the preservation of the nation’s prehistoric and historical resources.

National Wildlife Refuge System Administration Act (1966)—Defines the National Wildlife Refuge System and authorizes the Secretary of the Interior to permit any use of a refuge, provided such use is compatible with the major purposes for which the refuge was established.

National Wildlife Refuge System Improvement Act of 1997—Sets the mission and administrative policy for all refuges in the National Wildlife Refuge System; mandates comprehensive conservation planning for all units of the Refuge System.

Native American Graves Protection and Repatriation Act (1990)—Requires federal agencies and museums to inventory, determine ownership of, and repatriate cultural items under their control or possession.

Pittman-Robertson Act (1937)—Taxes the purchase of ammunition and firearms and earmarks the proceeds to be distributed to the states for wildlife restoration. It is also called the Federal Aid in Wildlife Restoration Act or P-R Act.

Refuge Recreation Act (1962)—Allows the use of refuges for recreation when such uses are compatible with the refuge’s primary purposes and when sufficient funds are available to manage the uses.

Rehabilitation Act (1973)—Requires programmatic accessibility in addition to physical accessibility for all facilities and programs funded by the federal government to ensure that any person can participate in any program.

Volunteer and Community Partnership Enhancement Act (1998)—Encourages the use of volunteers to help in the management of refuges within the Refuge System; facilitates partnerships between the Refuge System and nonfederal entities to promote public awareness of the resources of the Refuge System and public participation in the conservation of the resources; and encourages donations and other contributions.

Wilderness Act (1964)—The Wilderness Act of 1964 (Public Law 88-577 (16 U.S.C. 1131-1136)) established the National Wilderness Preservation System and a process for federal and land management agencies, including the Service, to recommend wilderness areas to Congress. The Act defines wilderness as “A wilderness, in contrast with those areas where man and his works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain.” An area of wilderness is further defined to mean in this act an area of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man’s work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least 5,000 acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

Appendix C

Section 7 Biological Evaluation

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION FORM

For

Development and Implementation of the Comprehensive Conservation Plan for the
U. S. Fish and Wildlife Service
Red Rock Lakes National Wildlife Refuge

Originating Person: Bill West, Jeff Warren, and Laura King
Telephone Number: 406/276/3536
Date: May 7, 2009

- I. Region: 6
- II. Service Activity (Program): Red Rock Lakes National Wildlife Refuge—
Comprehensive Conservation Plan
- III. Pertinent Species and Habitat:
 - A. Listed species and/or their critical habitat within the action area:
Gray wolf, experimental population, non-essential
 - B. Proposed species and/or proposed critical habitat within the action area:
None
 - C. Candidate species within the action area: None
- IV. Geographic area or station name and action:
Station: Red Rock Lakes National Wildlife Refuge
Action: Development and implementation of Comprehensive Conservation Plan
- V. Location: map attached (Figure 1 of the accompanying CCP)
 - A. Ecoregion Number and Name:
Red Rock Lakes is located in Region 6, Mountain-Prairie Region, within the
Upper Missouri, Yellowstone, and Upper Columbia Rivers Ecosystem in southwestern
Montana.
 - B. County and State: Beaverhead County, Montana
 - C. Distance (miles) and direction to nearest town: Red Rock Lakes National Wildlife
Refuge is located 47 miles west of West Yellowstone and 38 miles east of the town
of Lima, Montana
 - D. Species/habitat occurrence:

Gray Wolf: There are no established packs on the refuge but wolves have recently
begun utilizing the refuge and the surrounding Centennial Valley.

VI. Description of proposed action:

This proposed action will implement the goals, objectives, and strategies of Red Rock Lakes National Wildlife Refuge comprehensive conservation plan for the next 15 years, in addition to fulfilling the goals of the National Wildlife Refuge System.

There will be improved management of wetland habitats for trumpeter swans and other waterfowl. Management will focus on maintaining high wetland productivity through infrequent drawdowns of modified and created wetlands to benefit breeding and migrating waterfowl. The management of riparian areas will be designed to benefit migratory bird species and adfluvial Arctic grayling. Some modified wetlands will be restored back to free-flowing streams and associated riparian corridors. Management actions (such as prescriptive cattle grazing and prescribed fire) will be directed toward specific habitat and wildlife objectives, with increased and improved oversight, monitoring, and research (when appropriate) conducted to assess if management objectives are being met. If bison become designated as free-ranging wildlife in Montana, the refuge will study the impact of participating in state-wide reintroduction initiatives.

Although there are no known established wolf packs on the refuge or in the surrounding Centennial Valley, wolves have recently been utilizing the refuge. During public scoping there were concerns raised by the public, in particular cattle grazers on and off the refuge, regarding potential future wolf predation on cattle. The Service added the following strategy to the CCP to address impacts from wolves should this occur:

Do not permit lethal control of carnivores (such as wolf, grizzly bear, and mountain lion) on the refuge to protect cattle used in the prescribed grazing program without permission from the refuge manager, a special use permit, and consultation with other partners who have successfully used nonlethal methods for controlling wolves preying on cattle.

Visitor Services

Management will emphasize improving and maintaining high-quality public opportunities for wildlife-dependent recreation for visitors of all abilities. Visitors will be better oriented to the refuge through accurate brochures and limited signage. Some of the criteria for all public use programs is to (1) ensure all proposed uses are compatible, (2) visitors know that they are visiting a national wildlife refuge, (3) visitors understand the specific regulations in place to provide for their safety and protection of the refuge resources and wildlife, and (4) any additional visitor facilities and signage complement the refuge's wilderness setting. In this plan, additional environmental education and interpretation opportunities will be provided in order to better orient the public while fostering support for refuge programs through a better understanding and awareness of the values of the refuge and Centennial Valley.

Hunting programs will continue to be modified or expanded to provide quality hunting experiences while ensuring that trumpeter swans and other priority migratory birds are provided protected resting areas. An auto tour route along roads open to the public will be developed and interpreted through a brochure and minimal signage. An accessible hunting/photo blind will be provided for photographers and hunters with disabilities.

Facilities and Staff

Refuge and visitor services facilities will continue to be maintained, including historical structures that are being used. The staff numbers and refuge housing has remained fairly stagnant since the 1950s. The refuge currently has five full-time staff members, including one biologist. In order to implement this plan, additional staff will be required. Up to four residences will be needed to accommodate additional staff. These residences will complement the other refuge buildings and be constructed within the same general area as the current refuge houses and headquarters.

VII. Description of the proposed action:

A. Explanation of the effects of the action on species and critical habitats in items III. A, B, and C:

Gray Wolf: Implementing the CCP will not have detrimental effects on gray wolves. The actions proposed in the CCP will conserve or enhance the habitat and prey that wolves utilize. It is difficult to predict if a wolf pack will become established in the valley and if any issues will arise regarding cattle grazers. The CCP does briefly address this in a strategy. The CCP does not completely discount lethal methods to address future issues. Nevertheless, this would be the last resort, requiring management approval and a special use permit.

B. Explanation of actions to be implemented to reduce adverse effects:

The refuge is surrounded by cattle ranches and also utilizes prescriptive cattle grazing as a habitat management tool. Cattle grazing on the refuge is limited to late season (i.e., after July 10) and most cattle are off the refuge by mid-September. This (1) limits the time that wolf depredation on cattle can occur, (2) ensures that abundant native prey are available for wolves, and (3) provides for larger calves when permittees put cattle on the refuge. These factors have been successful to date in preventing wolf depredation on cattle used for habitat management. There are still concerns, expressed by the public, that wolves have the potential to depredate cattle on the refuge. In anticipation of this occurring, a strategy was added to the final CCP that will allow lethal control of wolves with refuge manager approval and a special use permit. Before this will be permitted, the Service will work with other partners, including the state and livestock owners, to exhaust all nonlethal methods.

VIII. Effect determination and response requested: (*=optional)

A. Listed species/designated critical habitat:

<u>Determination</u>	<u>Response requested</u>
no effect to species/critical habitat (species/unit: _____)	_____ <u>X</u> _____ *Concurrence
may affect, but is not likely to adversely affect species/critical habitat (species/unit: <u>gray wolf</u>)	_____ <u>X</u> _____ Concurrence
no effect to species/critical habitat (species/unit: _____)	_____ _____ Formal Consultation

Bill West

6/5/09

Bill West
Project Leader
Red Rock Lakes National Wildlife Refuge
Lima, MT

Date

IX. Reviewing ESO Evaluation:

- A. Concurrence _____ Noncurrence _____
- B. Formal consultation required _____
- C. Conference required _____
- D. Informal conference required _____

R. Mark Wilson

6-8-09

R. Mark Wilson, Ecological Services
Supervisor, Ecological Services
Helena, MT

Date

Appendix D

Preparers

This document is the result of the extensive, collaborative, and enthusiastic efforts by members of the planning team shown below.

<i>Team Member</i>	<i>Position</i>	<i>Work Unit</i>
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Laurel Bowen	Editor	TBC Solutions, Clinton, TN
Bob Brannon	Area biologist	Montana Fish, Wildlife, and Parks; region 3; Sheridan, Montana
Mark Ely	Geographic information system (GIS) specialist	Division of Planning, region 6, Lakewood, CO
Laura King	Planning team leader	Division of Planning, region 6, Cayuga, ND
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Mike Parker	<i>Former</i> Refuge manager, through 8/08	Red Rock Lakes National Wildlife Refuge, Lima, MT
Jeff Warren	Wildlife biologist	Red Rock Lakes National Wildlife Refuge, Lima, MT
Bill West	Refuge manager	Red Rock Lakes National Wildlife Refuge, Lima, MT

Many organizations, agencies, and individuals provided invaluable assistance with the preparation of this CCP. The Service acknowledges the efforts of the following individuals and groups towards the completion of this plan. The diversity, talent, and knowledge contributed dramatically improved the vision and completeness of this document.

<i>Contributor</i>	<i>Title</i>	<i>Agency</i>
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Rick Coleman	Assistant regional director, Refuge System	USFWS
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Appendix E

Environmental Compliance

Environmental Action Statement

U.S. Fish and Wildlife Service, Region 6
Lakewood, Colorado

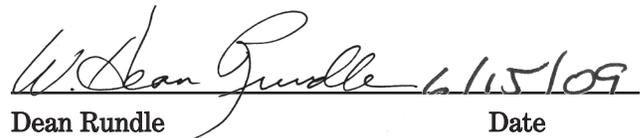
Within the spirit and intent of the Council on Environmental Quality's regulations for implementing the National Environmental Policy act and other statutes, orders, and policies that protect fish and wildlife resources, I have established the following administrative record.

I have determined that the action of implementing the "Comprehensive Conservation Plan—Red Rock Lakes National Wildlife Refuge" found not to have significant environmental effects, as determined by the attached "finding of no significant impact" and the environmental assessment as found with the draft comprehensive conservation plan.

 6/15/09

Steve Guertin
Regional Director, Region 6
U.S. Fish and Wildlife Service
Lakewood, CO

Date

 6/15/09

Dean Rundle
Refuge Supervisor, Region 6
U.S. Fish and Wildlife Service
Lakewood, CO

Date

 6/10/09

Richard A. Coleman, PhD
Assistant Regional Director, Region 6
National Wildlife Refuge System
U.S. Fish and Wildlife Service
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Date

 6/5/09

Bill West
Refuge Manager
Red Rock Lakes
National Wildlife Refuge
Lima, MT

Date

Finding of No Significant Impact

U.S. Fish and Wildlife Service, Region 6
Lakewood, Colorado

Four management alternatives for Red Rock Lakes National Wildlife Refuges were assessed as to their effectiveness in achieving the refuges' purposes and their impacts on the human environment.

- Alternative A, the “no-action” alternative, would continue current management.
- Alternative B acknowledges the importance of naturally functioning ecological communities on the refuge. However, alternations of the landscape (such as creating and modifying wetlands, impounding and diverting water, invasive species) prevent managing the refuge solely as a naturally functioning ecological community. Some of these changes have been significant and will require “hands on” management actions during the life of this plan, including the continued treatment of invasive species. Two created ponds would be restored to naturally functioning riparian areas, providing spawning habitat for one of the last known endemic populations of adfluvial Arctic grayling in the contiguous United States. The remaining wetlands would be maintained, managed, and protected for the benefit of migratory birds, including trumpeter swans. The refuge management actions would continue to support regional and national plans for federal trust species while continuing to work closely with the state on managing resident wildlife populations. Visitor services programs (such as hunting, fishing, wildlife observation and photography, and outreach and interpretation programs) would be improved and expanded while maintaining the wilderness characteristics of the refuge.
- Alternative C acknowledges the importance of a naturally functioning ecosystem. Management action emphasis would be placed on allowing wetland and riparian habitats to function naturally through the restoration of all created and modified wetlands and elimination of water diversions. The refuge would continue to support regional and national plans for federal trust species, including the trumpeter swan. Visitor services programs (such as hunting, fishing, wildlife observation and photography, and environmental education, outreach, and interpretation programs) would be improved and expanded while maintaining the wilderness characteristics of the refuge.
- Alternative D acknowledges the importance of a naturally functioning ecosystem. Management action emphasis would be placed on the restoration of all natural processes, including the restoration of wetland and riparian habitats. The refuge would continue to support regional and national plans for federal trust species, including the trumpeter swan. The refuge would place emphasis on creating a wilderness setting in all areas away from refuge headquarters. Visitor services programs would promote a wilderness experience with little to no signage and interpretation.

Based on this assessment and comments received, I have selected alternative B as the preferred alternative for implementation. The preferred alternative was selected because it best meets the purposes for which Red Rock Lakes National Wildlife Refuge was established and is preferable to the “no-action” alternative in light of physical, biological, economic, and social factors. The preferred alternative will continue to provide public access for wildlife-dependent recreation at Red Rock Lakes National Wildlife Refuge (hunting, fishing, wildlife observation, photography, environmental education, and interpretation).

I find that the preferred alternative is not a major federal action that would significantly affect the quality of the human environment within the meaning of Section 102(2)(C) of the National Environmental Policy Act of 1969. Accordingly, the preparation of an environmental impact statement on the proposed action is not required.

The following is a summary of anticipated environmental effects from implementation of the preferred alternative:

- The preferred alternative will not adversely impact endangered or threatened species or their habitat.
- The preferred alternative will not adversely impact archaeological or historical resources.
- The preferred alternative will not adversely impact wetlands nor does the plan call for structures that could be damaged by or that would significantly influence the movement of floodwater.

- The preferred alternative will not have a disproportionately high or adverse human health or environmental effect on minority or low-income populations.
- The state of Montana has been notified and given the opportunity to review the comprehensive conservation plan and associated environmental assessment.



Steve Guertin

Date

Regional Director, Region 6
U.S. Fish and Wildlife Service
Lakewood, CO

Appendix F

Compatibility Determinations

Refuge Name: Red Rock Lakes National Wildlife Refuge

Date Established: April 22, 1935

ESTABLISHING AND ACQUISITION AUTHORITIES

- Executive Order 7023, April 22, 1935
- Executive Order 7172, September 4, 1935
- 16 U.S.C. § 715d (Migratory Bird Conservation Act)
- 16 U.S.C. § 460k-2 (Refuge Recreation Act) (16 U.S.C. § 460k-460k-4), as amended
- 16 U.S.C. § 3901(b) (Emergency Wetlands Resources Act of 1986)
- 16 U.S.C. § 742f(a)(4) and 16 U.S.C. § 742f(b)(1) (Fish and Wildlife Act of 1956)
- 16 U.S.C. § 668dd(a)(2) (National Wildlife Refuge System Administration Act)

REFUGE PURPOSES

- “As a refuge and breeding ground for wild birds and animals.” (Executive Order 7023)
- “For use as an inviolate sanctuary, or for any other management purpose, for migratory birds.” (16 U.S.C. § 715d (Migratory Bird Conservation Act))
- “Suitable for—(1) incidental fish and wildlife-oriented recreational development, (2) the protection of natural resources, (3) the conservation of endangered species or threatened species ... The Secretary ... may accept and use ... real ... property. Such acceptance may be accomplished under the terms and conditions of restrictive covenants imposed by donors.” (16 U.S.C. § 460k-1, k-2 (Refuge Recreation Act) (16 U.S.C. § 460k-460k-4), as amended))
- “The conservation of the wetlands of the Nation in order to maintain the public benefits they provide and to help fulfill international obligations contained in various migratory bird treaties and conventions.” (16 U.S.C. § 3901(b) (Emergency Wetlands Resources Act of 1986))

- “For the development, advancement, management, conservation, and protection of fish and wildlife resources ... for the benefit of the United States Fish and Wildlife Service, in performing its activities and services. Such acceptance may be subject to the terms of any restrictive or affirmative covenant, or condition of servitude.” (16 U.S.C. § 742f(a)(4), (b)(1) (Fish and Wildlife Act of 1956))
- “Conservation, management, and ... restoration of the fish, wildlife, and plant resources and their habitats ... for the benefit of present and future generations of Americans.” (16 U.S.C. § 668dd(a)(2) (National Wildlife Refuge System Administration Act))
- “Wilderness areas ... shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness.” (16 U.S.C. § 1131 (Wilderness Act))

NATIONAL WILDLIFE REFUGE SYSTEM MISSION

The mission of the System is to administer a national network of lands and waters for the conservation, management, and where appropriate, restoration of the fish, wildlife, and plant resources and their habitats within the United States for the benefit of present and future generations of Americans.

DESCRIPTION OF USE: BIG GAME HUNTING

Hunting in the Centennial Valley is a traditional form of wildlife-dependent recreation. Waterfowl hunting has been allowed on the refuge since its establishment. However, big game hunting on the

refuge was not allowed until 1952 when a limited moose hunt was initiated. This limited hunt occurred until 1958. From 1959 to 1962, the only hunting allowed on the refuge was for waterfowl. A very limited pronghorn hunt was allowed in 1963 in the northeastern corner of the refuge. This hunt area was expanded in 1964 to include all refuge lands on the north side of the refuge (north of Lower Lake, River Marsh area and Upper Lake). In 1965 hunting of waterfowl, elk, deer, pronghorn, and moose was allowed on the refuge. The hunt was separated in space with waterfowl hunting occurring on Lower Lake, deer and elk hunting occurring south of South Valley Road (Red Rock Pass Road), pronghorn hunting occurring on the north side of the refuge (north of River Marsh, and Upper and Lower Red Rock lakes), and moose hunting occurring in the southeastern corner of the refuge (also known as the willow fen area). Big game and waterfowl hunting have continued on the refuge, using various scenarios of time and space separation to manage potential and observed conflicts.

Red Rock Lakes National Wildlife Refuge proposes to continue and expand opportunities for big game hunting that are compatible with refuge purposes. Hunting is identified as a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. Hunting of deer (white-tailed and mule), pronghorn, elk, and moose will be permitted in designated hunting areas on the refuge. Hunting will be conducted in accordance with Montana state regulations and refuge-specific regulations. When appropriate, zoning (utilizing time and space separation) will be used to resolve conflicts with other user groups.

The refuge big game hunting program objectives are to (1) control and maintain ungulate populations at a level that is compatible with plant and wildlife animal communities on the refuge (for example, to prevent over-browsing of willow communities), and (2) provide the public with high-quality wildlife-oriented recreation. Managing elk will also have a beneficial impact on plant communities outside of the refuge.

The refuge proposes to expand opportunities to hunt deer, elk, and pronghorn on the refuge. The hunting area will be delineated by physical features (such as roads and creeks). To create a contiguous hunting area and eliminate hunting boundary confusion, moose hunting will be opened throughout the area west and north of South Valley Road (Red Rock Pass Road), and north to Elk Springs Creek. The area south of South Valley Road will be closed to moose hunting to eliminate a road hunting issue. Areas in the northern section of the refuge will be opened to deer, elk, and pronghorn hunting. The refuge will address illegal road hunting by adopting a regulation that no big game hunting will be permitted within 50 yards of the center line of any county or refuge road.

Seasons and regulations vary for each big game species. The refuge will continue the practice of opening moose hunting later than the state season, around mid-October. In collaboration with MFWP, this hunting season may be modified (lengthened or shortened further) in the future to meet habitat and population objectives. Refuge staff estimate 800 hunter visits during the big game season. Hunting pressure varies but is usually heaviest during the opening of each season.

Access will be on foot for a majority of the area because most of the hunting area exists in Red Rock Lakes Wilderness. However, stock animals will be allowed south of South Valley Road (Red Rock Pass Road), mainly to allow access into the Centennial Mountains. Stock may be used in order to retrieve big game on the refuge. Stock may not be used in areas north of the South Valley Road (Red Rock Pass Road) except for retrieval purposes. There will be one accessible blind downriver from Lower Lake.

AVAILABILITY OF RESOURCES

Adequate funding exists to administer the big game hunt program. The refuge will require one existing or proposed staff person to maintain law enforcement credentials. In addition, existing law enforcement partnerships with the Bureau of Land Management and Montana Fish, Wildlife and Parks will continue.

ANTICIPATED IMPACTS OF USE

The direct effects of hunting on big game include mortality, wounding, and changes in distribution. However, regulated big game hunting has been used as a management tool to control ungulate populations, which helps ensure high-quality habitats. This results in healthy individuals and populations of big game species. In addition, it is well recognized that hunting has given many people a deeper appreciation of wildlife and a better understanding of the importance of conserving their habitat, which has ultimately contributed to the Refuge System mission. Despite the potential negative impacts of hunting, a goal of the refuge is to provide opportunities for quality wildlife-dependent recreation. By law, hunting is one of the six priority public uses of the National Wildlife Refuge System. The key focus is to offer a safe quality program and maintain adverse impacts within acceptable limits.

Hunting on the refuge does affect big game movements, distribution, and behavior. Big game species will likely spend more time in wooded habitats during the day as well as in closed areas (regardless of habitat type) on the refuge. Hunting also increases agitation, nervousness, and energetic expenditures associated with running from hunters

and the sounds of weapons being fired. Changing the areas where hunting is allowed from one year to the next may increase these impacts because big game would have to learn where the “safe zones” are every year. This will also negatively impact wildlife viewing opportunities because there may not be a particular area each year where big game animals will congregate. Areas on the refuge that have traditionally been closed to hunting provide some of the best big game viewing opportunities to see white-tailed deer, elk, and moose. Big game animals typically congregate in these closed areas.

Direct negative impacts of big game hunting on other wildlife will be minimal because hunting occurs in the fall when breeding and nesting seasons are over. Most land birds and many of the waterfowl have migrated out of the valley when peak big game hunting occurs. Other birds (such as owls, ravens, and magpies) do remain in the area during hunting season; these species of birds actually benefit from the added forage created by the remains of harvested animals. Any disturbance impacts on most predators and scavengers will probably be outweighed by this increase in food in the form of gut piles and carcass remains.

Recreational hunting activities may, in some cases, result in competition for limited resources (such as preferred campsites or use areas) between hunters and other refuge users. However, campsites are typically available even during the peak of hunting season. In addition, a portion of the areas closed to hunting are still open to other wildlife-dependent recreation activities such as wildlife viewing and wildlife photography. Some big game animals tend to congregate in the closed areas. This behavior may ultimately provide refuge visitors with increased opportunities to view animals such as moose, elk, and deer. However, the aesthetic value of viewing may be diminished by the occasional sound of gunshots.

DETERMINATION

Recreational big game hunting is a compatible use at Red Rock Lakes National Wildlife Refuge.

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

The refuge big game hunt program will be designed to provide quality experiences. A quality hunt experience means that

- hunters are safe;
- hunters exhibit high standards of ethical behavior;
- hunters are provided with uncrowded conditions;
- hunters have reasonable harvest opportunities;
- hunters are clear on which areas are open and closed to hunting;

- minimal conflicts occur between hunters and other visitors, especially those engaging in wildlife-dependent priority public uses.

The hunt program will include the following restrictions to reduce impacts:

- A limited hunt area (areas will be posted and enforced).
- Use of stock animals to retrieve game.
- Use of stock animals south of South Valley Road (Red Rock Pass Road) to access other areas of the Centennial Mountains.
- Periodic biological and social monitoring and evaluation of the hunting program, including feedback from users to determine if objectives of a quality experience are being met.
- To address illegal road hunting, no big game hunting will be permitted within 50 yards of the center line of any county or refuge road.
- When the area open to big game hunting is expanded, special restrictions may be enforced to ensure the expanded hunting activities are conducted in a safe and ethical manner. This may include limiting the number of big game hunters, modifying hunting dates, and changing the method of harvest. This new hunting area includes the area north of South Valley Road, south of Red Rock Creek and west of Upper Red Rock Lake to the west boundary of the refuge.
- The refuge will continue to partner with MFWP to limit the number of moose hunters. Only eleven moose hunters are currently allowed in Hunting District 334, which encompasses the refuge.
- The refuge will continue the practice of opening moose hunting later than the state season. In collaboration with MFWP, this hunting season may be modified (lengthened or shortened further) in the future to meet habitat and population objectives.

Hunter compliance with current state big game and refuge-specific regulations will be achieved through a combination of printed information, signing, outreach efforts, and enforcement of regulations by law enforcement officers.

JUSTIFICATION

Hunting is one of the six priority public uses of the National Wildlife Refuge System. Providing for a quality hunting program contributes to achieving one of the refuge goals. This program as described was determined to be compatible in view of the potential impacts that hunting, camping, and use of stock animals can have on the Service’s ability to achieve refuge purposes and goals. The refuge will be opened to big game hunting, with sufficient restrictions in place on hunting, use of stock

animals, and other visitor services to ensure a quality hunting program.

Refuge hunt programs are designed to provide quality experiences. In general, hunting on refuges should be superior to that available on other public lands, which may require special restrictions (Refuge Manual 8RM5). Measures are often used to ensure quality. The restricted hunt program is proposed on the refuge to (1) provide a quality hunting experience that meets refuge guidelines and policies, (2) prevent conflicts with other priority wildlife-dependent public uses, and (3) control and maintain ungulate populations at a level that is compatible with plant and wildlife animal communities on the refuge and meets habitat objectives (for example preventing over-browsing of willow communities) outlined in the refuge's comprehensive conservation plan.

The hunting areas provide distinct, manageable units that can be easily delineated and enforced. It is anticipated that big game will find sufficient food resources and resting places, both inside and outside of the hunt area; the physiological condition of big game and other wildlife species will not be impaired; and their overall state and national population status will not be impaired, that is, the species will not be in jeopardy of becoming federally threatened or endangered.

Mandatory 15-year reevaluation date: 2024

DESCRIPTION OF USE: WATERFOWL HUNTING

The Red Rock Lakes National Wildlife Refuge Comprehensive Conservation Plan proposes to continue to provide limited opportunities for waterfowl hunting (a wildlife-dependent recreation) that are compatible with the refuge's purpose. Hunting is identified as a priority public use of the National Wildlife Refuge System under the National Wildlife Refuge System Improvement Act of 1997. Hunting of waterfowl (limited to coots, ducks, and geese) will be permitted in a designated hunting area on and surrounding the Lower Red Rock Lake (also known as Lower Lake) and River Marsh area.

Hunting will be consistent with annual Montana state hunting regulations and seasons, as well as applicable specific refuge and federal regulations. The waterfowl hunting season generally falls within the period from October through early January. However, waterfowl hunting on the refuge typically does not occur after October because all water is frozen, and very few waterfowl remain in the area. There will be no limit on the number of hunters and hunt days and one accessible blind site downriver of the Lower Lake water control structure (WCS) will be available. Refuge staff estimate 300 hunter visits during the waterfowl season. A majority of hunter visits occur on the first two weekends of the

year. Hunting pressure is almost nonexistent during weekdays and after the second weekend of the hunting season.

Access will be on foot and by nonmotorized boats for a majority of the area because most of the hunting area exists in Red Rock Lake Wilderness. However, motorized boats will be allowed from the Lower Red Rock Lake WCS downstream on Red Rock Creek. During the hunting season, hunting dogs will be allowed off leash and under voice control for the purpose of retrieving waterfowl.

AVAILABILITY OF RESOURCES

Adequate funding exists to administer the waterfowl hunt program. One existing or proposed staff person will be required to maintain law enforcement credentials. In the interim, law enforcement assistance is available during periods of heavy use. The Service will also continue to maintain its enforcement partnerships with the Bureau of Land Management and Montana Fish, Wildlife and Parks.

ANTICIPATED IMPACTS OF USE

Adequate funding exists to administer the waterfowl hunt program. There is currently no law enforcement staff on-site. There is some law enforcement presence during periods of heavy use. Partnerships have been developed with the Bureau of Land Management and Montana Fish, Wildlife and Parks to assist with law enforcement needs. This plan does propose adding law enforcement capabilities for the staff.

By its very nature, waterfowl hunting has very few, if any, positive effects on waterfowl and other birds while the activity is occurring. However, it is well recognized that this activity has given many people a deeper appreciation of wildlife and a better understanding of the importance of conserving their habitat, which has ultimately contributed to the Refuge System mission. Furthermore, despite the potential impacts of hunting, a goal of the refuge is to provide opportunities for quality wildlife-dependent recreation. By law, hunting is one of the six priority public uses of the National Wildlife Refuge System. A key concern is to offer a safe and quality program and to keep adverse impacts within acceptable limits.

Although hunting directly impacts individual birds, the amount of waterfowl harvest is not expected to have a measurable effect on refuge, national or international populations, especially since waterfowl hunting activity is extremely limited (in time and space) on the refuge. For example, the refuge staff estimates that approximately 300 hunter visits are made annually to the refuge. Over the entire season, the average hunter visit per day will be approximately 3.0 during an average season. However, since Lower Red Rock Lake freezes up around November 1, the average on the refuge is probably closer to 9.1 hunter visits per day. Hunting

may be either compensatory or additive to natural mortality (Anderson 1995). Compensatory mortality occurs when hunting substitutes for other forms of mortality (such as disease, competition, predation, and severe weather). Additive mortality occurs when hunting compounds the total mortality. In some cases, hunting can be used as a management tool to control populations. In concert with Canada, Mexico, and multistate flyway councils, the Service and Montana Fish, Wildlife and Parks regulate hunting so that harvest does not reduce populations to unsustainable levels.

Direct effects of hunting on waterfowl are mortality, wounding, and disturbance (DeLong 2002). Hunting can alter behavior (such as foraging time), population structure, and distribution patterns of wildlife (Bartelt 1987, Cole and Knight 1990, Madsen 1985, Owens 1977, Raveling 1979, Thomas 1982, White-Robinson 1982). In Denmark, hunting was documented to affect the diversity and number of birds using a site (Madsen 1995). Bird diversity changed from predominantly mute swan and mallard to a more even distribution of a greater number of species when a sanctuary was established. Hence, species diversity increased with the elimination of hunting. There also appears to be an inverse relationship between the number of birds using an area and hunting intensity (DeLong 2002). In Connecticut, lesser scaup were observed to forage less in areas that were heavily hunted (Cronan 1957). In California, the numbers of northern pintails on Sacramento National Wildlife Refuge nonhunt areas increased after the first week of hunting and remained high until the season was over in early January (Heitmeyer and Raveling 1988). Following the close of hunting season, ducks generally increased their use of the hunt area; however, use was lower than before the hunting season began.

Human disturbance to staging birds and other wildlife using the open waters and marshes on the refuge will occur as a result of hunting activity. Migratory and wintering waterfowl generally attempt to minimize time spent in flight and maximize foraging time because flight requires considerably more energy than any other activity, other than egg laying. Human disturbance associated with hunting includes loud noises and rapid movements, such as those produced by shotguns and boats powered by motors. This disturbance, especially when repeated over a period of time, compels waterfowl to change food habits, feed only at night, lose weight, or desert feeding areas (Belanger and Bedard 1990, Madsen 1995, Wolder 1993). Disturbance levels from hunting activity outside Chincoteague National Wildlife Refuge were found to be high enough to force wintering black ducks into a pattern of nocturnal feeding within surrounding salt marshes and diurnal resting within refuge impoundments (Morton et al. 1989a, 1989b). Unhunted populations have been documented to behave differently from hunted ones (Wood 1993).

These impacts can be reduced by the presence of sanctuary areas where hunting does not occur, and birds can feed relatively undisturbed. Sanctuaries or nonhunt areas have been identified as the most common solution to disturbance problems caused from hunting (Havera et al. 1992). Prolonged and extensive disturbances may cause large numbers of waterfowl to leave disturbed areas and migrate elsewhere (Madsen 1995, Paulins 1984). In Denmark, hunting disturbance effects were experimentally tested by establishing two sanctuaries (Madsen 1995). Over a 5-year period, these sanctuaries became two of the most important staging areas for coastal waterfowl. Numbers of dabbling ducks and geese increased four- to twenty-fold within the sanctuary (Madsen 1995). Thus, sanctuary areas are very important to minimize disturbance to waterfowl populations to ensure their continued use of the refuge.

Intermittent hunting can be a means of minimizing disturbance, especially if rest periods in between hunting events are weeks rather than days (Fox and Madsen 1997). It is common for refuges with heavily used hunt programs to manage their programs with nonhunt days. At Sacramento National Wildlife Refuge, 3%–16% of northern pintails were located in hunt units during nonhunt days, but they were almost entirely absent in those same units on hunt days (Wolder 1993). In addition, northern pintails, American wigeon, and northern shovelers decreased time spent feeding on days when hunting occurred on public shooting areas, as compared to nonhunt days (Heitmeyer and Raveling 1988). However, intermittent hunting may not always greatly reduce hunting impacts. At Sacramento National Wildlife Refuge, the intermittent hunting of three hunt days per week results in lower northern pintail densities on hunt areas during nonhunt days than establishing nonhunt areas (Wolder 1993). In Germany, several studies reported a range from a few days to approximately 3 weeks for waterbird numbers to recover to pre-disturbance levels (Fox and Madsen 1997). The proposed hunt program at Red Rock Lakes National Wildlife Refuge will not be intermittent due to the limited nature of the hunting season, limited use that occurs during weekdays, and the limited amount of area that is open to hunting.

Boating activity associated with hunting during the fall can alter distribution, reduce use of particular habitats or entire areas by waterfowl and other birds, alter feeding behavior and nutritional status, and cause premature departure from areas (Knight and Cole 1995). In the upper Midwest, motor boating and hunting have been found to be the two main activities that disturb waterfowl (Korschgen et al. 1985). In Connecticut, selection of feeding sites by lesser scaup was influenced by disturbances from hunters, anglers, and pleasure boats (Cronan 1957). In Germany, boat pressure on wintering waterfowl had reached such a high level that it was necessary to establish larger sanctuaries, implement a seasonal

closure on water sports and angling, and impose a permanent ban on hunting (Bauer et al. 1992). Impacts of boating can occur even at low densities, given their noise, speed, and ability to cover extensive areas in a short amount of time. However, impacts from boating at Red Rock Lakes National Wildlife Refuge will be greatly reduced because a majority of the proposed hunting area will be open only to nonmotorized boating. Thus, much of the disturbance impacts (identified above due to quick movements, noise, and the ability to cover large areas in a short amount of time) will not apply to this refuge. As such, the use of nonmotorized boats is one way of minimizing disturbance to waterbirds at this refuge. In addition, allowing only nonmotorized boating on a majority of the hunting area provides for a very unique experience not easily found in southwest Montana. Each year, the refuge staff receives comments from hunters who specifically come to this refuge because of the nonmotorized regulations.

Additional impacts from hunting activity include conflicts with individuals participating in other wildlife-dependent priority public uses, such as canoeing, kayaking, and wildlife observation. However, the refuge currently provides a minimum of 3,200 acres of wetlands that are closed to hunting, but open to nonmotorized boating and wildlife observation. In addition, approximately 4,500 acres of upland habitat is closed to hunting but open for visitors to participate in wildlife observation activities on foot.

DETERMINATION

Waterfowl hunting is a compatible use at Red Rock Lakes National Wildlife Refuge.

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

The refuge's waterfowl hunt program will be designed to provide quality experiences. A quality hunt experience means that

- hunters are safe;
- hunters exhibit high standards of ethical behavior;
- hunters are provided with uncrowded conditions;
- hunters have reasonable harvest opportunities;
- hunters are clear on which areas are open and closed to hunting;
- minimal conflicts occur between hunters and other visitors, especially those engaging in wildlife-dependent priority public uses.

The hunt program will include the following restrictions to reduce impacts:

- a limited hunt area
- use of nonmotorized boats, except downstream (west) of the Lower Red Rock Lake WCS
- use of closed areas, as needed, to provide sufficient feeding and resting habitat for waterfowl
- periodic biological and social monitoring and evaluation of the hunting program, including feedback from users to determine if the objectives for a high-quality experience (as defined above) are being met

Hunter compliance with current migratory bird and refuge regulations will be achieved through a combination of printed information, signing, outreach efforts, and enforcement of regulations by law enforcement officers.

JUSTIFICATION

Hunting is one of the six priority public uses of the National Wildlife Refuge System. Providing for a quality hunting program contributes to achieving one of the refuge goals. This program as described was determined to be compatible, in view of potential impacts that hunting and supporting activities (boating) can have on the Service's ability to achieve refuge purposes and goals. The refuge will be opened to waterfowl hunting, with sufficient restrictions in place on hunting, boating, and other public uses to ensure that an adequate amount of quality feeding and resting habitat would be available in relatively undisturbed areas (sanctuaries) for a majority of waterfowl and other wetland birds using the refuge.

Refuge hunt programs are designed to provide high-quality experiences. In general, hunting on refuges should be superior to that available on other public lands, which may require special restrictions (Refuge Manual 8RM5). Measures are often used to ensure quality. The limited hunt program is proposed on the refuge to (1) provide a quality hunting experience that meets refuge guidelines and policies, (2) provide sufficient waterfowl sanctuary, and (3) prevent conflicts with other priority wildlife-dependent public uses.

Consolidation of the hunting area into a single block of land provides a distinct, manageable unit that can be easily delineated, and enforced. It is anticipated that birds will find sufficient food resources and resting places, both inside and outside the hunt area, such that their abundance and use of the refuge will not be measurably lessened, hunting pressure will not cause premature departure from the area, the physiological condition of waterfowl and other waterbirds will not be impaired, their behavior and normal activity patterns will not be altered dramatically, and their overall population status will not be impaired.

Mandatory 15-year reevaluation date: 2024

DESCRIPTION OF USE: RECREATIONAL FISHING

Recreational fishing (a wildlife-dependent activity) has been identified in the National Wildlife Refuge System Improvement Act of 1997 as a priority public use, provided it is compatible with the purpose for which the refuge was established. An establishment authority for Red Rock Lakes National Wildlife Refuge, the Refuge Recreation Act, provides for “incidental fish and wildlife-oriented recreational development.”

Currently, fishing is allowed on Odell, Red Rock, and Elk Springs (west of Elk Lake Road) creeks under state river and stream seasons. Culver, Widgeon, and MacDonald ponds, and Elk Springs Creek (east of Elk Lake Road) are open seasonally (July 15–October 1). All other refuge waters are closed to fishing to protect breeding waterfowl and trumpeter swans. Game fish include native Westslope cutthroat trout (although mostly hybridized with nonnatives), Arctic grayling, and limited mountain whitefish. Nonnative game species include brook, Yellowstone cutthroat, and rainbow trout. There are unimproved parking areas at the ponds. Vehicle access points with minimal parking exist at two locations on Red Rock Creek and one each at Elk Springs and Odell creeks. Commercial guiding is not allowed.

Anglers must use nontoxic artificial lures or flies. Lead sinkers are prohibited. Fishing with bait is not permitted in order to reduce introduction of nonnative invasive species and increase the survival of released native fish. The refuge has not collected data on fishing use. From observations, Red Rock Creek receives the greatest fishing pressure. There is the potential for some Arctic grayling mortality due to such things as trampling of eggs and catch and release fishing. To minimize future impacts on Arctic grayling from fishing, no additional parking areas will be created.

The refuge does not stock nonnative fish species to protect Arctic grayling populations. A primary objective of the comprehensive conservation plan is to restore Arctic grayling and Westslope cutthroat trout populations. While refuge streams will be open in compliance with state regulations, fishing closures in target creeks and ponds may be implemented while restoration work is being completed.

The comprehensive conservation plan proposes the following fishing opportunities:

- Until the structures are removed from Culver and MacDonald ponds, and the Arctic grayling fishery is restored to these areas and also to Widgeon Pond, all three will be open under state river and stream regulations to fishing from the bank, unless closure is necessary to protect nesting swans or adfluvial Arctic grayling restoration efforts.

- All refuge streams will be open to fishing in compliance with refuge, and the state’s river and stream regulations.
- To protect native Arctic grayling and Westslope cutthroat populations, visitors will be encouraged to keep all nonnative fish they catch in accordance with state regulations.
- Red Rock Creek west of the Lower Lake WCS will be opened to fishing.

AVAILABILITY OF RESOURCES

Sufficient resources are available at the current levels of fishing pressure. The refuge will continue to work with Montana Fish, Wildlife and Parks to conduct fish and creel surveys.

ANTICIPATED IMPACTS OF USE

Fishing and other human activities cause disturbance to wildlife. This disturbance may have cumulative impacts on wildlife, habitat, and the fisheries resource. This includes more disturbances to wildlife, vegetation trampling, potential introduction and spread of aquatic nuisance species and invasive terrestrial plants, potential transmission of diseases including whirling disease, problems associated with disposal of human waste, and deposition of lead sinkers and fishing line. Birds or mammals feeding or resting may be disturbed by anglers fishing from the bank. The current visitor use is usually low enough that disturbance by anglers causes minimal impacts on most wildlife species. Opening the remaining creeks on the refuge to fishing should not impact Arctic grayling because they have not been found during surveys outside of Odell and Red Rock creeks. Educational efforts will be implemented to inform visitors to inspect, clean, and dry fishing equipment to prevent the spread of aquatic nuisance species.

DETERMINATION

Recreational fishing is a compatible use at Red Rock Lakes National Wildlife Refuge.

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

- To protect migratory waterbirds, fishing is not allowed on Swan Lake, Lower and Upper Red Rock lakes, and River Marsh between Upper and Lower Red Rock Lake.
- Fishing on the creeks is open according to Montana state river and stream seasons.
- Until the structures are removed from Culver and MacDonald ponds, and the Arctic grayling fishery is restored to these areas and also to Widgeon Pond, all three will be open under state river and stream regulations unless closure is necessary to protect nesting swans or Arctic grayling restoration efforts.

- Anglers must use nontoxic artificial lures or flies.
- Lead sinkers are prohibited.
- Fishing with bait is not permitted.
- The harvest of nonnative game fish species is promoted.
- Commercial guiding is not permitted.
- Existing use is monitored to ensure that disturbance to wildlife continues to be minimal.
- Existing signage is improved or replaced.

JUSTIFICATION

Based upon the biological impacts described above and in the environmental assessment, it is determined that recreational fishing within Red Rock Lakes National Wildlife Refuge will not materially interfere with or detract from the purposes for which the refuge was established. One of the secondary goals of the National Wildlife Refuge System is to provide opportunities for public fishing when compatible, and it is identified as a priority public use in the National Wildlife Refuge System Improvement Act of 1997. Current recreational fishing at the refuge will support this goal with only minimal conflicts with the wildlife conservation mission of the Refuge System.

Mandatory 15-year reevaluation date: 2024

DESCRIPTION OF USE: WILDLIFE OBSERVATION AND PHOTOGRAPHY

Wildlife observation and photography are major public uses at the refuge. The beauty and uniqueness of the area combined with the abundance of various bird and mammal species draw over 12,000 visitors each year. The refuge will continue to support and enhance opportunities related to wildlife observation and photography. Supporting uses to assist visitors in wildlife observation and photography are vehicle access, foot access (including hiking trails), campgrounds, nonmotorized boat, and bicycle access. These supporting uses (access) will be controlled and regulated through the publication of refuge brochures and through information posted at the kiosks.

Wildlife observation and photography are two of the six wildlife-dependent recreational uses specified in the Improvement Act.

Wildlife observation and photography will be allowed across most of the refuge, with the exception of the closure of Shambow Pond and the area surrounding the residences, shop, and equipment yard.

Foot travel, including hiking, snowshoeing, and cross-country skiing, is permitted throughout the refuge except for the above-mentioned closed areas.

Passenger vehicles, motorcycles and bicycles will be restricted to county and public refuge roads. Seasonal road closures, due to weather, limit access during the winter and spring months. Snowmobiles are not permitted on refuge roads and are allowed only on county roads. All-terrain vehicles (ATVs) must be licensed for highway use to be able to operate on county and refuge roads.

Nonmotorized boat access is seasonally allowed on Red Rock Creek, Upper and Lower Red Rock lakes and River Marsh which connects the two lakes. Boating access is difficult if a drought persists due to the shallowness of the lakes. Sailing is not permitted.

Horses, mules, llamas, and other animals used for riding or packing are permitted only for access into mountainous areas south of South Valley Road (Red Rock Pass Road).

The CCP proposes to continue the above uses and add the following to improve wildlife observation and wildlife photography:

- Update and improve refuge signs and brochures.
- Develop an auto tour route.
- Investigate the development of accessible habitat specific wildlife-viewing/photography areas, infrastructure or trails.
- Work with the county road department to provide accessible pulloffs for the safe viewing of wildlife and photography.
- Build one accessible photography/waterfowl hunting blind downstream from the Lower Red Rock Lakes WCS.

AVAILABILITY OF RESOURCES

Developing new facilities outlined in the comprehensive conservation plan is closely tied to funding requests in the form of the refuge operation needs system and the maintenance management system projects. Existing programs such as current refuge directional signs and brochures can be updated with available resources.

ANTICIPATED IMPACTS OF USE

Wildlife observation and photography can affect wildlife resources positively or negatively. A positive effect of public involvement for these priority public uses will be a better appreciation and more complete understanding of the refuge's wildlife and habitats. That can translate into widespread and stronger support for the refuge, Refuge System, and the Service.

Walking and hiking is expected to minimally disturb wildlife and wildlife habitat at the current and proposed levels. Increased disturbance to wildlife will occur in areas regularly frequented by visitors,

such as the campgrounds and trails. During snow-free months, the majority of visitors restrict their pedestrian use to the trails and parking areas, which concentrates these uses along the road system, minimizing disturbance to wildlife and habitats. The majority of bird species migrate out of the area in the winter months. Elk, pronghorn, and mule deer also tend to leave the valley. Winter pedestrian travel will have little to no impact on other species because of the inaccessibility of the refuge. White-tailed deer and moose around the headquarters are disturbed more frequently in the winter from pedestrian travel but can easily move away from those visitors who are snowshoeing or skiing.

Vehicular access, while restricted to the roads, allows visitors to cover more ground, potentially increasing the number of times an animal is disturbed, but it may be of shorter duration compared to pedestrian disturbance. Wildlife disturbance, especially impacts to moose from snowmobiles traveling through the refuge has not been studied. Snowmobiles are restricted to the county roads. Snowmobile use on the South Valley Road to Elk Lake Road is low at this time. The use may dramatically increase if a resort business opens up in Lakeview in the near future. Snowmobile use through the refuge on Elk Lake Road is relatively high (average 30 snowmobiles/day). These visitors come from West Yellowstone and go up to Elk Lake Resort for lunch. This use needs to be monitored for impacts on wildlife.

Nonmotorized boating is restricted to Red Rock Creek and Upper Red Rock Lake from July 1 to freeze-up. Lower Red Rock Lake and River Marsh which connects the two lakes are open September 1 to freeze-up. Kayaks and canoes are the typical nonmotorized boats used. Wildlife disturbance from human-powered boating displaces birds from the immediate area of the visitors. The slow speeds of the boats and large size of the lakes allow the birds to easily move to another area without further disturbance. This use needs to be monitored for impacts on wildlife. Educational efforts will be implemented to inform visitors to inspect, clean, and dry boating equipment to prevent the spread of aquatic nuisance species.

No cultural resources will be impacted. No impact on endangered species should occur.

There may be temporary disturbance to wildlife near the activity. Direct short-term impacts may include minor damage from traffic on refuge roads and trails when wet and muddy. Temporary disturbance may occur due to facility improvements. However, suitable habitats exist nearby and effects on wildlife will be minor and nonpermanent.

The Service does not expect substantial cumulative impacts from these two priority uses in the near term, but it will be important for refuge staff to

monitor these uses and, if necessary, respond to conserve high-quality wildlife resources.

Refuge staff, in collaboration with volunteers, will monitor and evaluate the effects of these priority public uses to discern and respond to any unacceptable impacts on wildlife or habitats. To mitigate those impacts, the refuge will close areas where birds such as bald eagles, colonial waterbirds, or swans are nesting. The Service expects no additional effects from providing these two priority uses.

DETERMINATION

Wildlife observation and photography are compatible uses at Red Rock Lakes National Wildlife Refuge.

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

- Wildlife observation and photography will be allowed across most of the refuge, with the exception of the closure of Shambow Pond and the area surrounding the residences, shop, and equipment yard.
- Foot travel, including hiking, snowshoeing, and cross-country skiing, is permitted throughout the refuge, except for around the residences, shop, equipment yard, and Shambow Pond.
- Passenger vehicles, motorcycles, and bicycles will be restricted to county and public refuge roads. Roads may be closed at any time due to weather and snow conditions. Snowmobiles are not permitted on refuge roads and are restricted to county roads. All terrain vehicles must be licensed for highway use to be able to operate on refuge and county roads.
- Nonmotorized boat access is seasonally allowed on Red Rock Creek, Upper and Lower Red Rock lakes, and River Marsh which connects the two lakes. Boating access is difficult if a drought persists due to the shallowness of the lakes. Sailing is not permitted.
- Horses, mules, llamas, and other animals used for riding or packing are permitted only for access into mountainous areas south of South Valley Road (Red Rock Pass Road).
- An increase in education and law enforcement patrols will minimize illegal or undesirable activity.
- Newly constructed viewing areas will be designed to minimize disturbance impacts on wildlife and all refuge resources while providing a good opportunity to view wildlife in their natural environments.

JUSTIFICATION

According to the National Wildlife Refuge System Improvement Act of 1997, wildlife observation and photography are priority public use activities that should be encouraged and expanded where possible. It is through compatible public uses such as this that the public becomes aware of and provides support for refuges.

Mandatory 15-year reevaluation date: 2024

DESCRIPTION OF USE: ENVIRONMENTAL EDUCATION AND INTERPRETATION

Environmental education and interpretation are both defined as wildlife-dependent recreational uses under the Improvement Act. Currently these programs have been opportunistic as time and staff allows. School group participation in environmental education can be limited due to road conditions and distance from communities. A few organized groups request tours and talks during the summer months. Interpretation is limited to brochures, information panels inside the headquarters visitor contact station, two standalone panels, and four kiosks. In addition, the refuge does not have an auto tour route or interpretation along current roads or designated trails.

The comprehensive conservation plan proposes to continue with the above uses, and add the following to improve environmental education and interpretation:

- Hire a temporary visitor services technician to develop and carry out environmental education and interpretive programs.
- The refuge website will be expanded to include educational tools, including Centennial Valley resource information, classroom projects, and online exercises.
- Update refuge signs and brochures, identifying public trails and roads.
- Develop and interpret an auto tour route along roads currently open to the public.
- Replace three existing kiosks, add one new kiosk, and update all interpretive panels.
- Improve Sparrow Pond Trail so it is an accessible trail.

AVAILABILITY OF RESOURCES

Funding for these activities is supported solely by annual operation and maintenance money. Resources are stretched in order to continue providing environmental education and interpretation at the refuge. Implementing new facilities outlined in the comprehensive conservation plan is closely tied to funding requests in the form of the refuge operation needs system and the maintenance management

system projects. Existing programs such as current refuge directional signs and brochures can be updated with available resources.

ANTICIPATED IMPACTS OF USE

The use of the refuge to provide interpretation and environmental education on the refuge may impose a low-level impact on those sites used for these activities. Impacts may include trampling vegetation and temporary disturbance to wildlife species in the immediate vicinity.

DETERMINATION

Environmental education and interpretation use are compatible uses at Red Rock Lakes National Wildlife Refuge.

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

Visitors participating in environmental education and interpretation programs will follow all refuge regulations. On-site activities should be held where minimal impact will occur.

JUSTIFICATION

One of the secondary goals of the National Wildlife Refuge System is to provide opportunities for the public to develop an understanding and appreciation for wildlife when it is found compatible with other goals. The above uses are identified as priority public uses in the National Wildlife Refuge System Improvement Act of 1997.

Environmental education and interpretation are used to encourage an understanding in citizens of all ages to act responsibly in protecting wildlife and its habitat. These are tools used in building land ethics, developing support for the refuge, and decreasing wildlife violations.

Environmental education at the refuge is incidental to other programs since there is no full-time staff to conduct these activities. However, the program is important and provides visitors with an awareness of refuge-specific issues such as wetland ecology, migratory bird management, and issues relating to the entire Refuge System.

Based on anticipated biological impacts and in the environmental assessment, it is determined that environmental education and interpretation on the refuge will not interfere with refuge habitat goals and objectives or the purposes for which it was established. Limits to access and monitoring can help mitigate any adverse impacts.

Mandatory 15-year reevaluation date: 2024

DESCRIPTION OF USE: CAMPING

Red Rock Lakes National Wildlife Refuge manages two primitive campgrounds for visitors participating in wildlife-dependant recreation. Camping is not permitted elsewhere on the refuge. The campgrounds provide opportunities to participate in wildlife-dependent recreation without traveling great distances. Because of the distance to town and limited public land access, the campgrounds are used regularly by visitors who are bird watching, photographing wildlife, fishing, hunting, and hiking or biking the Continental Divide trails. Groups touring the valley and refuge also use the campgrounds for day use.

Camping is permitted year-round, but it primarily occurs from May through October with some use in November. Access to the campgrounds in the winter is limited to travel across snow-covered roads, and the vault toilets are not maintained. Visitors observing and photographing wildlife are the primary users during the summer, with hunters dominating in the fall. Camping is allowed for up to 16 consecutive days. Fires are only allowed in fire rings, and visitors can collect dead and downed material. Garbage must be packed out. Visitors to the campgrounds rarely litter. Food and carcass storage is required to protect grizzly and black bears, and visitors. The refuge will provide bear-proof storage containers for hikers, bicyclists, and motorcyclists, and for hunters to store carcasses.

Upper Lake campground receives the most use by visitors due to its beautiful scenery and location adjacent to the county road. It provides two vault toilets (not accessible), piped spring water, picnic tables (one accessible), and fire rings. The entrance road and all campsites need repairs. There are no hookups, parking, or turnarounds specifically for recreational vehicles (RVs). This limits RVs from using this campground, which provides more campsites for hikers, bicyclists, and vehicle campers. This minimizes conflicts between vehicles using generators and low-impact campers. There are eleven designated sites. There is a boat launch (not accessible) for nonmotorized boats. An informational kiosk is provided to inform the visitor about the refuge and its wildlife. Upper Red Rock Lake is open to nonmotorized boats from July 1 to freeze-up to protect breeding birds.

River Marsh campground provides two vault toilets (not accessible) and fire rings. There are no designated campsites here and it can accommodate RVs. This campground is primarily used during hunting seasons, especially waterfowl hunting because it provides immediate access to open hunt areas. Summer use does occur by wildlife observers who want to get away from the county road. There is a boat launch for nonmotorized boats. Lower Red Rock Lake is open to nonmotorized boats from September 1 to freeze-up to protect breeding birds.

Universally accessible toilets will replace old toilets at both campgrounds, along with an accessible campsite at River Marsh campground. Other improvements, such as food storage containers, picnic tables, fire rings, and road repair, will increase the safety for visitors and the opportunities to use the refuge over multiple days. A recreational fee will be charged to help offset the maintenance of the campgrounds.

AVAILABILITY OF RESOURCES

Existing funding and staffing are adequate to maintain the refuge campgrounds to provide access to wildlife-dependent activities on and off the refuge. During the peak summer months, volunteers maintain the vault toilets, pick up litter, and clean campsites. They also make many contacts with visitors, educating them about the refuge and its wildlife. The campgrounds are both about 4 miles away from headquarters, which allows for easy access to patrol and monitor visitors. Operating the campgrounds as a fee unit will require, at a minimum, one full day a week of staff time for collecting and counting of money and increased law enforcement presence. The refuge contracts the pumping of the vault toilets. The Upper Lake toilets need to be pumped twice a year due to the high use and inadequate size of the vaults. The refuge could reduce pumping needs to once a year or less by replacing the old vault toilets with adequately sized, clean-smelling vault toilets. The new toilets will meet Architectural Barriers Act requirements. This improvement is dependent upon funding from the Visitor Facility Enhancement Program.

ANTICIPATED IMPACTS OF THE USE

Some short-term impacts, such as littering, vegetation trampling, and wildlife disturbance, can be expected, but these are not anticipated to be significant at current or increased levels of camping. This is because the vast majority of visitors travel the long distances over rough roads to enjoy the scenery, outdoors, solitude, and wildlife of the refuge. Isolation buffers the refuge from visitors looking for a party location. Very few problems have occurred with visitors using the campgrounds.

The Upper Lake campground is surrounded by thick vegetation, and visitors tend to watch wildlife within the open areas of the campground and along the county road. Refuge staff regularly receive reports by visitors who see moose, badger, fox, and deer walking through the campground. River Marsh campground is located in open grassland habitat next to Lower Red Rock Lake. Wildlife disturbance primarily impacts waterfowl that move away from the shoreline when there are people present in the campground. The potential for accidental wildfires exists, but with education, the hazard can be reduced or eliminated. If environmental conditions

warrant, burn bans will be put into place to eliminate campfires.

The use of these primitive campsites by through hikers, bicyclists, and motorcyclists on the Contiguous and Great Divide trails will not adversely impact refuge purposes and objectives. This use is at a low level and is not expected to substantially increase over the next 15 years.

DETERMINATION

Camping is a compatible use at Red Rock Lakes National Wildlife Refuge.

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

- The refuge will continue to enforce general visitor services regulations which protect habitat and wildlife, and limit disturbance to other refuge visitors.
- The refuge manager may prohibit fires during periods of high fire danger.
- The refuge will continue to provide information to campers.
- Expansion of the campgrounds will not occur.
- A detailed step-down visitor services plan will be completed and will include planned improvements to the existing impacted area within the campgrounds such as placement of new accessible vault toilets, and planned campsite placement.
- Commercial operations will not be allowed to use the campgrounds.

JUSTIFICATION

Camping is not a priority wildlife-dependent recreational use as identified in the National Wildlife Refuge System Improvement Act of 1997. It is, however, an activity in support of other priority uses, such as fishing, hunting, wildlife observation, and photography. It is a policy of the U.S. Fish and Wildlife Service that, “We may allow other activities on refuges, such as camping, to facilitate compatible wildlife-dependent recreation.” (605 FW 1, 1.2B). Camping on the refuge will have limited negative impacts on natural resources when conducted under the above stipulations. To maintain the campground facilities, contact visitors, and administer a recreation fee program will require more time than it has in the past. The refuge will be able to effectively manage this use with a temporary seasonal visitor services technician. Camping, therefore, at its current level of use will not negatively interfere with the purposes of the refuge or the mission of the Refuge system.

Mandatory 15-year reevaluation date: 2024

DESCRIPTION OF USE: COMMERCIAL FILMING, AUDIO RECORDING, AND STILL PHOTOGRAPHY

Commercial filming is defined as the digital or film recording of a visual image or sound recording by a person, business, or other entity for a market audience, such as for a documentary, television or feature film, advertisement, or similar project. It does not include news coverage or visitor use. Still photography is defined as the capturing of a still image on film or in a digital format.

Red Rock Lakes National Wildlife Refuge and its designated wilderness is an incredibly scenic and beautiful landscape with tremendous opportunities for commercial filming and commercial still photography. The refuge provides an ideal setting for filmmakers and photographers. Each year the refuge staff receives approximately one to five requests to conduct commercial filming or commercial still photography on the refuge. Each request is evaluated on an individual basis, using a number of Department of the Interior, U.S. Fish and Wildlife Service, and National Wildlife Refuge System policies (for example, 43 CFR Part 5, 50 CFR Part 7, 8 RM 16). Commercial filming will be managed on the refuge through the special user permit process (except as described below for certain activities conducted by commercial still photographers—see “Stipulations Necessary to Ensure Compatibility”) to minimize the possibility of damage to cultural or natural resources or interference with other visitors to the area. In addition, much of the refuge is designated wilderness area. A minimum-requirements decision guide will be completed for all commercial filming activities proposed in Red Rock Lakes Wilderness. This process involves determining if an essential task should be conducted in the wilderness area, and then determining the combination of methods, equipment, or administrative practices necessary to successfully and safely administer the refuge and accomplish wilderness management objectives.

The use includes access by groups or individuals in vehicles on roads open to the general public, by nonmotorized boats on refuge waters open to the general public, and on refuge lands open to the general public. In rare cases, access to areas closed to the general public may be permitted through the special use permit process.

AVAILABILITY OF RESOURCES

In general, the refuge will normally incur no expense except administrative costs for review of applications, issuance of a special use permit, and staff time to conduct compliance checks. These costs may be able to be recovered as outlined in a Proposed Rule modifying commercial filming and still photography policy for the several agencies within the Department of the Interior. This Proposed Rule

is currently in the public review process (*Federal Register*, Volume 72, Number 160, dated August 20, 2007).

ANTICIPATED IMPACTS OF THE USE

Wildlife photographers and filmmakers tend to create the largest disturbance impacts of all wildlife observers (Dobb 1998, Klein 1993, Morton 1995). While wildlife observers frequently stop to view species, wildlife photographers are more likely to approach wildlife (Klein 1993). Even a slow approach by wildlife photographers tends to have behavioral consequences on wildlife species (Klein 1993). Other impacts include the potential for photographers to remain close to wildlife for extended periods of time, in an attempt to habituate the wildlife subject to their presence (Dobb 1998) and the tendency for photographers with low-power lenses to get much closer to their subjects (Morton 1995). This usually results in increased disturbance to wildlife and habitat, including the trampling of plants. Handling of animals and disturbing vegetation (such as cutting plants, and removing flowers) is prohibited on the refuge.

A special use permit will be denied if the commercial filming, audio recording, or still photography activities are found not to be compatible with refuge purposes.

DETERMINATION

Commercial filming, audio recording, and still photography are compatible uses at Red Rock Lakes National Wildlife Refuge.

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

All commercial filming requires a special use permit.

- Special use permits will identify conditions that protect the refuge's values, purposes, resources; public health and safety, and prevent unreasonable disruption of the public's use and enjoyment of the refuge. Such conditions may be, but are not limited to, specifying road conditions when access will not be allowed, establishing time limitations, and identifying routes of access into the refuge. These conditions will be identified to prevent excessive disturbance to wildlife, damage to habitat or refuge infrastructure, or conflicts with other visitor services or management activities.
- The special use permit will stipulate that imagery produced on refuge lands will be made available to the refuge to use in environmental education and interpretation, outreach, internal documents, or other suitable uses. In addition, any commercial products must include appropriate credits to the refuge, the National

Wildlife Refuge System, and the U.S. Fish and Wildlife Service.

- The commercial filming or still photography use must demonstrate a means to extend public appreciation and understanding of wildlife or natural habitats, or enhance education, appreciation, and understanding of the National Wildlife Refuge System, or facilitate outreach and education goals of the refuge. Failure to demonstrate any of these criteria will result in a special use permit being denied.
- Still photography requires a special use permit (with specific conditions as outlined above) if one or more of the following will occur:
 - it takes place at locations where or when members of the public are not allowed.
 - it uses model(s), set(s), or prop(s) that are not part of the location's natural or cultural resources or administrative facilities.
 - the refuge will incur additional administrative costs to monitor the activity.
 - the refuge will need to provide management and oversight to: avoid impairment of the resources and values of the site; limit resource damage; or minimize health and safety risks to the visiting public.
 - the photographer(s) intentionally manipulate(s) vegetation to create a "shot" (for example cutting vegetation to create a blind).
- To minimize impact on refuge lands and resources, the refuge staff will ensure that all commercial filmmakers and commercial still photographers (regardless of whether a special use permit is issued) comply with policies, rules, and regulations, and refuge staff will monitor and assess the activities of all filmmakers, photographers, and audio recorders.

JUSTIFICATION

Allowing commercial filming, still photography or audio recording is an economic use that must contribute to the achievement of the refuge purposes, mission of the National Wildlife Refuge System, or the mission of the U.S. Fish and Wildlife Service. Providing opportunities for commercial filming, still photography, or audio recording that meets the above requirements should result in an increased public awareness of the refuge's ecological importance as well as advancing the public's knowledge and support for the National Wildlife Refuge System and the U.S. Fish and Wildlife Service. The stipulations outlined above and conditions imposed in the special use permits issued to commercial filmmakers, still photographers, and audio recorders will ensure that these wildlife-dependent activities occur without adverse effects on refuge resources or refuge visitors.

Mandatory 15-year reevaluation date: 2024**DESCRIPTION OF USE: COMMERCIALY GUIDED OR OUTFITTED STOCK ANIMAL SERVICES FOR GAME RETRIEVAL AND ACCESS ACROSS THE REFUGE INTO THE CENTENNIAL MOUNTAINS**

Use of stock animals by the public to retrieve game and access the Centennial Mountains is currently authorized on the refuge (see “Recreational Hunting—Compatibility Determination” which was evaluated separately). There is no authorized use of hunting guides on the refuge.

Commercially guided and/or outfitted stock animal services can be divided into two categories. The first is the use of stock animals (with or without the services of the stock owner) to retrieve big game taken on the refuge or adjacent lands. This service is typically provided to moose hunters on the refuge as it is usually logistically difficult to remove moose carcasses on foot due to the terrain and size of the animal. In addition, this service has been typically provided to hunters that take an elk off-refuge in the upper elevations of the Centennial Mountains. Many times, the only feasible access to this animal is to cross refuge property with the outfitted stock animals. Approximately, ten to twenty pack trips are made annually to retrieve animals.

The second category of use is to provide access to hunters, campers, and environmental education students that are being guided and/or taught by the sole outfitting and guiding service (known as Centennial Outfitters) authorized to operate in the Centennial Mountains (under State of Montana and Bureau of Land Management permits). Access to the Centennial Mountains across public land is extremely limited—especially on the east end of the mountain range where the refuge exists. Access into the Centennial Mountains by this outfitter is restricted to two access points across the refuge (Odell Creek Trail and Shambow Trail). Approximately sixty-five to seventy-five trips are made each year over a period of 55 to 65 days. The majority of the trips occur in September, October, and November. Trips vary in the number of stock animals that are used from one (just a rider on a horse) up to twenty-three animals (various number of riders and pack animals). The largest number of animals occurs during the summer months (typically July) when Centennial Outfitters are offering day trips for wildlife observation and environmental education and interpretation programs.

Centennial Outfitters is the sole commercial operation licensed to operate in the Centennial Mountains. Access onto and across the refuge has been conducted utilizing a special use permit in past years. As of 2005, Centennial Outfitters reports all

trips made across the refuge as well as the number of riders and animals used as a condition of their special use permit.

The use of commercially provided stock animals contributes to fulfillment of refuge purposes and to the National Wildlife Refuge System mission by facilitating priority public uses (hunting, wildlife observation, interpretation and environmental education) and management of healthy wildlife populations through controlled hunting.

AVAILABILITY OF RESOURCES

Adequate refuge personnel and base operational funds are available to manage this commercial activity at existing levels. Administrative staff time primarily involves issuing one special use permit a year. This burden could be reduced by extending the period of use of this one permit. Fieldwork associated with administering this program primarily involves monitoring the permittee’s compliance with permit terms and assessing trail conditions. Total staff time for administering this permit is approximately 5 days per year.

ANTICIPATED IMPACTS OF THE USE

Wildlife disturbance from horseback riding and stock animals is not well-documented. However, some studies suggest that many wildlife species are habituated to livestock and that horseback wildlife observers can approach wildlife at closer distances than by other forms of travel (Bennett and Zuelke 1999, Williams and Conway-Durver 1998).

Horseback riding and the use of stock animals has both a direct and indirect effect on habitat. Trampling causes mortality of plant and animal species. Indirect effects result when soil is compacted and plants cannot reestablish (Summer 1980). Grazing can reduce vegetation. Nonnative plant species can be spread by stock animals through feces and seeds dropped that were caught in a stock animal’s hair. In addition, stock animal manure, although not harmful to human health, can cause conflicts with other trail users since it can be odorous, unaesthetic, and a nuisance.

While there can be user group conflicts and some limited safety issues resulting from hikers and commercial use of stock animals using the same trail, these are expected to be minimal given the current level of use.

In general the impacts to wildlife, plant species, and other visitors to the refuge are expected to be minimal given the current level of use by one outfitter using stock animals to access the Centennial Mountains or retrieve game animals from the refuge.

DETERMINATION

Commercially guided or outfitted stock animal services for game retrieval and access across the refuge into the Centennial Mountains is a compatible use at Red Rock Lakes National Wildlife Refuge.

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

- All commercial use of stock animals requires a special use permit. Special use permits will identify conditions that protect the refuge's values, purposes, resources, and public health and safety, as well as prevent unreasonable disruption of the public's use and enjoyment of the refuge. Such conditions may be, but are not limited to, specifying trail conditions when access will not be allowed, establishing limitations on the group size and number of trips allowed annually, recommendations for preventing the spread of nonnative vegetation, and identifying routes of access into the refuge. These conditions will be identified to prevent excessive disturbance to wildlife, damage to habitat or refuge infrastructure, or conflicts with other visitor services or management activities.
- The commercial use of stock animals must demonstrate a means to extend public appreciation and understanding of wildlife or natural habitats, or both; or enhance education, appreciation and understanding of the National Wildlife Refuge System; or facilitate outreach, education, and visitor services goals of the refuge. Failure to demonstrate any of these criteria will result in denial of a special use permit.
- Commercial stock animals may not be corralled, tethered, or hitched along trails on the refuge.

JUSTIFICATION

Commercially guided and outfitted stock animal services is a form of traditional activity that Congress intended to preserve with the enactment of the Wilderness Act, which is an important act guiding the management of the refuge. Access into the Centennial Mountains will be much more restricted if these services were not allowed. The requirements placed on recreation guides ensure that these commercial operations are safe and high-quality operations. These requirements are by the Bureau of Land Management through its selection process, by the refuge through the terms of a special use permit, and by the state of Montana through regulations placed on guides and outfitters. These services are a valuable benefit to a segment of the American public that is not physically able to, not comfortable with, or for other reasons chooses not to participate in unguided trips into the Centennial

Mountains. Access across the refuge by commercially guided or outfitted stock animals is essential to getting these types of Americans into Red Rock Lakes Wilderness. In addition, due to the difficulty of pedestrian travel in the area where moose hunting is allowed on the refuge, many moose hunters will not be able to retrieve their animals if this service were not provided.

Mandatory 15-year reevaluation date: 2024

DESCRIPTION OF USE: RESEARCH

Red Rock Lakes National Wildlife Refuge receives approximately one to three requests per year to conduct scientific research on the refuge. Priority will be given to studies that contribute to the enhancement, protection, preservation, and management of the refuge's native plant, fish, and wildlife populations and their habitats. Research applicants must submit a proposal that outlines the (1) objectives of the study; (2) justification for the study; (3) detailed study methodology and schedule; and (4) potential impacts on refuge wildlife and habitat, including disturbance (short and long-term), injury, or mortality. This includes (1) a description of measures the researcher will take to reduce disturbances or impacts; (2) personnel required and their qualifications and experience; (3) status of necessary permits (scientific collecting permits, endangered species permits); (4) costs to refuge and refuge staff time requested, if any; and (5) anticipated progress reports and end products (such as reports or publications). Refuge staff or others, as appropriate, will review research proposals and issues special use permits if approved.

Evaluation criteria will include, but not be limited to, the following:

- Research that will contribute to specific refuge management issues will be given higher priority over other requests.
- Research that will conflict with other ongoing research, monitoring, or management programs will not be approved.
- Research projects that can be conducted off-refuge are less likely to be approved.
- Research that causes undue disturbance or is intrusive will likely not be approved. The degree and type of disturbance will be carefully weighed when evaluating a research request.
- Research evaluation will determine if any effort has been made to minimize disturbance through study design, including adjusting location, timing, number of permittees, study methods, and number of study sites.
- If staffing or logistics make it impossible for the refuge to monitor researcher activity in a sensitive area, this may be reason to deny the request, depending on the specific circumstances.

- The length of the project will be considered and agreed upon before approval. Projects will be reviewed annually.

The refuge currently has an active land acquisition program. If newly acquired property includes areas of research interest, the same special use permit process and evaluation criteria described above will be followed.

AVAILABILITY OF RESOURCES

Adequate funding and staffing currently exist to manage a limited amount of research at Red Rock Lakes National Wildlife Refuge. As always, discretionary use of staff time will be weighed through a cost-benefit analysis. It is anticipated that approximately \$6,000 per year will be required to administer and manage research activities described above. Administration will include, but not be limited to, evaluation of applications, management of permits, and oversight of research projects.

ANTICIPATED IMPACTS OF USE

Some degree of disturbance is expected with all research activities since most researchers will be entering areas that are seasonally closed or conducting research in remote areas of the refuge that have limited visitation by the general public, and some research requires collection of samples or handling of wildlife. However, minimal impact on refuge wildlife and habitats is expected with research studies because special use permits will include conditions to ensure that impact to wildlife and habitats are kept to a minimum.

DETERMINATION

Research use is a compatible use at Red Rock Lakes National Wildlife Refuge.

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

- Extremely sensitive wildlife habitat areas and wildlife species will be provided sufficient protection from disturbance by limiting proposed research activities in these areas. All refuge rules and regulations must be followed unless otherwise exempted by refuge management.
- Refuge staff will use the criteria for evaluating a research proposal, as outlined above under "Description of Use," when determining whether to approve a proposed study on the refuge. If proposed research methods are evaluated and determined to have potential impacts on refuge resources (habitat or wildlife), it must be demonstrated that the research is necessary for refuge resource conservation management. Measures to

minimize potential impacts will need to be developed and included as part of the study design. In addition, these measures will be listed as conditions on the special use permit.

- Refuge staff will monitor research activities for compliance with conditions of the special use permit. At any time, refuge staff may accompany the researchers to determine potential impacts. Staff may determine that previously approved research and special use permits be terminated due to observed impacts. The refuge manager will also have the ability to cancel a special use permit if the researcher is out of compliance, or to ensure wildlife and habitat protection.

JUSTIFICATION

The program as described is determined to be compatible. Potential impacts of research activities on refuge resources will be minimized because sufficient restrictions will be included as part of the study design, and research activities will be monitored by the refuge staff. Research projects will contribute to the enhancement, protection, preservation, and management of the refuge's wildlife populations and their habitats.

Mandatory 15-year reevaluation date: 2024

DESCRIPTION OF USE: GRAZING

The refuge currently uses livestock grazing as a tool to manage a variety of upland, riparian, and seasonal wetland habitats. Livestock grazing has been a preferred management tool because the effect on habitat is controllable and measurable. Livestock grazing has been used in a variety of ways, including high intensity–short duration, rest rotation, and complete rest. Between 1994 and 2006 grazing rates ranged from 0.31–0.85 animal unit months (AUM) per acre, with an average of 3,790 AUM used annually. Actual rates per subunit varied substantially depending on the site, with some grazing unit rates being as low as 0.02 AUM per subunit and others as high as 2.17 AUM per acre. The refuge currently has twenty-three subunits where grazing is being used as a management tool. Maintenance of the fences is a constant effort due to weather, water, animal, and human impacts.

The comprehensive conservation plan proposes to continue using prescribed grazing in order to manage habitats. The comprehensive conservation plan will establish goals and objectives for specific habitat types (such as riparian, wet meadow, and shrub-steppe) where prescribed grazing may be used. In addition, target wildlife species (such as northern pintail and Brewer's sparrow) and their habitat requirements have been identified. This has resulted in development of objectives that will guide management to meet target wildlife species habitat

needs. The refuge will improve upon the vegetation and wildlife monitoring and research program in order to assess habitat and wildlife population responses to the prescribed grazing management program. Different grazing rates and management strategies will be investigated in order to determine the best methods for the refuge to meet the identified habitat goals and objectives of the comprehensive conservation plan.

AVAILABILITY OF RESOURCES

Current refuge staff and funding resources are limited for the purposes of monitoring habitats and implementing research needs to understand the impacts of grazing on refuge habitats. A minimum of one full-time seasonal biological technician will greatly enhance the refuge's ability to assess the outcomes of grazing. However, over the past 4 years, refuge staff have been able to use students from universities and colleges to lay the ground work for an improved monitoring program. In addition, the refuge recently completed a detailed vegetation inventory using the U.S. National Vegetation Classification Standards. Data were collected during the summers of 2005–2007. Field surveys were digitized, and a database for geographic information systems was generated. These data will greatly benefit the refuge in designing research and monitoring protocol for assessing the prescribed grazing management program.

ANTICIPATED IMPACTS OF USE

The prescribed grazing management program is intended to be used to meet habitat and species-specific goals and objectives identified in the comprehensive conservation plan. This management is intended to maintain and enhance habitat conditions for the benefit of a wide variety of fish and wildlife that use the refuge. Minimal negative impacts are expected through the use of this tool. Some trampling of areas may occur around watering areas or mineral licks. If fences are not maintained, it may be difficult to meet habitat objectives. It is anticipated that grazing will be in a mosaic pattern with some areas more intensely grazed than others in certain years. Grazing, as well as fire, is known to increase the nutrient cycling of nitrogen and phosphorous (Burke et al. 2005, Hauer and Spencer 1998, McEachern et al. 2000). Therefore, management of upland habitats adjacent to natural lakes (such as Upper and Swan lakes) and marshes could result in elevated levels of these nutrients in the lakes. Elevated levels of phosphorous and nitrogen can lead to increases in algae and turbidity in shallow lakes, which may ultimately lead to

significant losses of submerged aquatic vegetation communities (see for example, Egertson et al. 2004). In addition, the presence of livestock will be disturbing to some wildlife species and some visitors. The benefits of this habitat management tool are felt to outweigh these negative impacts.

DETERMINATION

Grazing use is a compatible use at Red Rock Lakes National Wildlife Refuge.

STIPULATIONS NECESSARY TO ENSURE COMPATIBILITY

- Maintain existing riparian fences and use temporary fencing, as needed, to protect riparian habitats from cattle.
- Carry out a vegetation monitoring program to assess if focal species habitat requirements are being met.
- Carry out a study to determine the influence of cattle grazing on the abundance and distribution of small mammals, as identified in the comprehensive conservation plan.
- Begin vegetation monitoring of shrub-steppe and grassland habitats to assure adequate coverage of sagebrush, native bunchgrasses, and forbs—as identified in the comprehensive conservation plan.
- Begin nutrient (such as phosphorus, nitrogen) monitoring in Lower Red Rock, Upper Red Rock, and Swan lakes to ensure that nutrient levels are not increased to a point that will result in algae and turbidity increases and decreases in submerged aquatic vegetation communities.
- Grazing will be monitored and restricted if necessary to minimize disturbance to nesting birds.

JUSTIFICATION

To maintain and enhance habitat for migratory birds and other wildlife, some habitat management needs to occur. Prescribed livestock grazing is one option that can be used to achieve desired habitat conditions. Prescribed grazing is a useful tool because it can be controlled, and results of the grazing can be monitored (for example, vegetation monitoring) so that adjustments to the program can be made in order to meet habitat goals and objectives.

Mandatory 15-year reevaluation date: 2024

Appendix G

Species List

Below is a list of resident and migrant wildlife and plant species found at or adjacent to Red Rock Lakes National Wildlife Refuge.

This list includes all mammals, fish, and herpetofauna expected to occur on Red Rock Lakes National Wildlife Refuge based on refuge files, unpublished systematic survey data, and other relevant literature and data that pertains to southwest Montana. Some species, such as the bison, fisher, and big horn sheep, have been extirpated from the refuge. Bird species

listed in this appendix are based on the Red Rock Lakes National Wildlife Refuge Bird List, as well as additional information from refuge files. Plant species listed in this appendix are based upon plant collections made on or near the refuge (Dorn 1969, Culver 1994, Paullin 1971), refuge files, and the recent vegetation mapping of the refuge (Newlon 2007).

Taxonomic order follows the Integrated Taxonomic Information System (<http://www.its.gov>) and the "Check-list of North American Birds" ((Anon.) 2007).

CLASS AMPHIBIA

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Caudata	Blotched tiger salamander	<i>Ambystoma mavortium melanostictum</i>
Anura	Western toad	<i>Bufo boreas</i>
Anura	Columbia spotted frog	<i>Rana luteiventris</i>
Anura	Boreal chorus frog	<i>Pseudacris maculate</i>

CLASS REPTILIA

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Squamata	Western terrestrial garter snake	<i>Thamnophis elegans</i>

CLASS AVES

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Anseriformes	Snow goose	<i>Chen caerulescens</i>
Anseriformes	Ross's goose	<i>Chen rossii</i> *
Anseriformes	Greater white-fronted goose	<i>Anser albifrons</i> *
Anseriformes	Canada goose	<i>Branta canadensis</i>
Anseriformes	Trumpeter swan	<i>Cygnus buccinator</i>
Anseriformes	Tundra swan	<i>Cygnus columbianus</i>
Anseriformes	Mute swan	<i>Cygnus olor</i> **
Anseriformes	Black swan	<i>Cygnus atratus</i> **
Anseriformes	Wood duck	<i>Aix sponsa</i>
Anseriformes	Gadwall	<i>Anas strepera</i>
Anseriformes	American wigeon	<i>Anas americana</i>
Anseriformes	Mallard	<i>Anas platyrhynchos</i>
Anseriformes	Blue-winged teal	<i>Anas discors</i>
Anseriformes	Cinnamon teal	<i>Anas cyanoptera</i>
Anseriformes	Northern shoveler	<i>Anas clypeata</i>
Anseriformes	Northern pintail	<i>Anas acuta</i>
Anseriformes	Green-winged teal	<i>Anas crecca</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Anseriformes	Canvasback	<i>Aythya valisineria</i>
Anseriformes	Redhead	<i>Aythya Americana</i>
Anseriformes	Ring-necked duck	<i>Aythya collaris</i>
Anseriformes	Lesser scaup	<i>Aythya affinis</i>
Anseriformes	Greater scaup	<i>Aythya marila*</i>
Anseriformes	Bufflehead	<i>Bucephala albeola</i>
Anseriformes	Common goldeneye	<i>Bucephala clangula</i>
Anseriformes	Barrow's goldeneye	<i>Bucephala islandica</i>
Anseriformes	Hooded merganser	<i>Lophodytes cucullatus</i>
Anseriformes	Common merganser	<i>Mergus merganser</i>
Anseriformes	Red-breasted merganser	<i>Mergus serrator</i>
Anseriformes	Ruddy duck	<i>Oxyura jamaicensis</i>
Anseriformes	Surf scoter	<i>Melanitta perspicillata*</i>
Anseriformes	White-winged scoter	<i>Melanitta fusca*</i>
Anseriformes	Long-tailed duck	<i>Clangula hyemalis*</i>
Anseriformes	Harlequin duck	<i>Histrionicus histrionicus*</i>
Galliformes	Ruffed grouse	<i>Bonasa umbellus</i>
Galliformes	Dusky grouse	<i>Dendragapus obscurus</i>
Galliformes	Greater sage-grouse	<i>Centrocercus urophasianus</i>
Galliformes	Columbia sharp-tailed grouse	<i>Tympanuchus phasianellus columbianus</i>
Galliformes	Gray partridge	<i>Perdix perdix+</i>
Galliformes	Ring-necked pheasant	<i>Phasianus colchicus**</i>
Gaviiformes	Common loon	<i>Gavia immer</i>
Gaviiformes	Arctic loon	<i>Gavia arctica*</i>
Podicipediformes	Pied-billed grebe	<i>Podilymbus podiceps</i>
Podicipediformes	Horned grebe	<i>Podiceps auritus</i>
Podicipediformes	Red-necked grebe	<i>Podiceps grisegena</i>
Podicipediformes	Eared grebe	<i>Podiceps nigricollis</i>
Podicipediformes	Western grebe	<i>Aechmophorus occidentalis</i>
Podicipediformes	Clark's grebe	<i>Aechmophorus clarkii</i>
Pelicaniformes	American white pelican	<i>Pelecanus erythrocephalus</i>
Pelicaniformes	Double-crested cormorant	<i>Phalacrocorax auritus</i>
Ciconiiformes	American bittern	<i>Botaurus lentiginosus*</i>
Ciconiiformes	Great blue heron	<i>Ardea Herodias</i>
Ciconiiformes	Great egret	<i>Ardea alba*</i>
Ciconiiformes	Snowy egret	<i>Egretta caerulea*</i>
Ciconiiformes	Black-crowned night-heron	<i>Nycticorax nycticorax</i>
Ciconiiformes	White-faced ibis	<i>Plegadis chihi</i>
Ciconiiformes	Turkey vulture	<i>Cathartes aura*</i>
Falconiformes	Osprey	<i>Pandion haliaetus</i>
Falconiformes	Bald eagle	<i>Haliaeetus leucocephalus</i>
Falconiformes	Northern harrier	<i>Circus cyaneus</i>
Falconiformes	Sharp-shinned hawk	<i>Accipiter striatus</i>
Falconiformes	Cooper's hawk	<i>Accipiter cooperii</i>
Falconiformes	Northern goshawk	<i>Accipiter gentilis</i>
Falconiformes	Swainson's hawk	<i>Buteo swainsoni</i>
Falconiformes	Red-tailed hawk	<i>Buteo jamaicensis</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Falconiformes	Ferruginous hawk	<i>Buteo regalis</i>
Falconiformes	Rough-legged hawk	<i>Buteo lagopus</i>
Falconiformes	Golden eagle	<i>Aquila chrysaetos</i>
Falconiformes	American kestrel	<i>Falco sparverius</i>
Falconiformes	Merlin	<i>Falco columbarius</i>
Falconiformes	Peregrine falcon	<i>Falco peregrinus</i>
Falconiformes	Prairie falcon	<i>Falco mexicanus</i>
Falconiformes	Gyr falcon	<i>Falco rusticolus</i> *
Gruiformes	Virginia rail	<i>Rallus limicola</i>
Gruiformes	Yellow rail	<i>Coturnicops noveboracensis</i> *
Gruiformes	Sora	<i>Porzana carolina</i>
Gruiformes	American coot	<i>Fulica americana</i>
Gruiformes	Sandhill crane	<i>Grus canadensis</i>
Gruiformes	Whooping crane	<i>Grus americana</i> *
Charadriiformes	Killdeer	<i>Charadrius vociferous</i>
Charadriiformes	Semipalmated plover	<i>Charadrius semipalmatus</i>
Charadriiformes	Mountain plover	<i>Charadrius montanus</i> *
Charadriiformes	Snowy plover	<i>Charadrius alexandrius</i> *
Charadriiformes	Black-bellied plover	<i>Pluvialis squatarola</i>
Charadriiformes	Black-necked stilt	<i>Himantopus mexicanus</i>
Charadriiformes	American avocet	<i>Recurvirostra americana</i>
Charadriiformes	Greater yellowlegs	<i>Tringa melanoleuca</i>
Charadriiformes	Lesser yellowlegs	<i>Tringa flavipes</i>
Charadriiformes	Solitary sandpiper	<i>Tringa solitaria</i>
Charadriiformes	Willet	<i>Catoptrophorus semipalmatus</i>
Charadriiformes	Spotted sandpiper	<i>Actitis macularia</i>
Charadriiformes	Upland sandpiper	<i>Bartamia longicauda</i> *
Charadriiformes	Long-billed curlew	<i>Numenius americanus</i>
Charadriiformes	Marbled godwit	<i>Limosa fedoa</i>
Charadriiformes	Long-billed dowitcher	<i>Limnodromus scolopaceus</i>
Charadriiformes	Wilson's snipe	<i>Gallinago delicata</i>
Charadriiformes	American woodcock	<i>Scolopax minor</i> *
Charadriiformes	Wilson's phalarope	<i>Phalaropus tricolor</i>
Charadriiformes	Red-necked phalarope	<i>Phalaropus lobatus</i> *
Charadriiformes	Parasitic jaeger	<i>Stercorarius parasiticus</i> *
Charadriiformes	Sanderling	<i>Calidris alba</i> *
Charadriiformes	Semipalmated sandpiper	<i>Calidris pusilla</i>
Charadriiformes	Western sandpiper	<i>Calidris mauri</i>
Charadriiformes	Least sandpiper	<i>Calidris minutilla</i>
Charadriiformes	White-rumped sandpiper	<i>Calidris fuscicollis</i>
Charadriiformes	Pectoral sandpiper	<i>Calidris melanotos</i> *
Charadriiformes	Dunlin	<i>Calidris alpina</i> *
Charadriiformes	Baird's sandpiper	<i>Calidris bairdii</i>
Charadriiformes	Franklin's gull	<i>Larus pipixcan</i>
Charadriiformes	Ring-billed gull	<i>Larus delawarensis</i>
Charadriiformes	California gull	<i>Larus californicus</i>
Charadriiformes	Herring gull	<i>Larus argentatus</i> *

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Charadriiformes	Bonaparte's gull	<i>Larus philadelphia*</i>
Charadriiformes	Forster's tern	<i>Sterna forsteri</i>
Charadriiformes	Black tern	<i>Sterna niger</i>
Charadriiformes	Caspian tern	<i>Sterna caspia*</i>
Charadriiformes	Common tern	<i>Sterna hirundo*</i>
Columbiformes	Mourning dove	<i>Zenaida macroura</i>
Columbiformes	Band-tailed pigeon	<i>Patagioenas fasciata*</i>
Columbiformes	Rock pigeon	<i>Columba livia*</i>
Cuculiformes	Black-billed cuckoo	<i>Coccyzus erythrophthalmus*</i>
Cuculiformes	Yellow-billed cuckoo	<i>Coccyzus americanus*</i>
Strigiformes	Great horned owl	<i>Bubo virginianus</i>
Strigiformes	Burrowing owl	<i>Athene cunicularia</i>
Strigiformes	Long-eared owl	<i>Asio otus</i>
Strigiformes	Short-eared owl	<i>Asio flammeus</i>
Strigiformes	Northern saw-whet owl	<i>Aegolius acadicus</i>
Strigiformes	Northern pygmy-owl	<i>Glaucidium gnoma</i>
Strigiformes	Western screech-owl	<i>Megascops kennicottii*</i>
Strigiformes	Great gray owl	<i>Strix nebulosa</i>
Caprimulgiformes	Common nighthawk	<i>Chordeiles minor</i>
Apodiformes	White-throated swift	<i>Aeronautes saxatalis*</i>
Apodiformes	Broad-tailed hummingbird	<i>Selasphorus platycercus</i>
Apodiformes	Rufous hummingbird	<i>Selasphorus rufus</i>
Apodiformes	Calliope hummingbird	<i>Stellula calliope</i>
Apodiformes	Black-chinned hummingbird	<i>Archilochus alexandri</i>
Coraciiformes	Belted kingfisher	<i>Ceryle alcyon</i>
Piciformes	Lewis' woodpecker	<i>Melanerpes lewis</i>
Piciformes	Red-headed woodpecker	<i>Melanerpes erythrocephalus*</i>
Piciformes	Downy woodpecker	<i>Picoides pubescens</i>
Piciformes	Hairy woodpecker	<i>Picoides villosus</i>
Piciformes	Black-backed woodpecker	<i>Picoides arcticus</i>
Piciformes	American three-toed woodpecker	<i>Picoides dorsalis</i>
Piciformes	Pileated woodpecker	<i>Dryocopus pileatus*</i>
Piciformes	Northern flicker	<i>Colaptes auratus</i>
Piciformes	Red-naped sapsucker	<i>Sphyrapicus nuchalis</i>
Piciformes	Williamson's sapsucker	<i>Sphyrapicus thyroideus</i>
Passeriformes	Western kingbird	<i>Tyrannus verticalis</i>
Passeriformes	Eastern kingbird	<i>Tyrannus forficatus</i>
Passeriformes	Say's phoebe	<i>Saynoris saya</i>
Passeriformes	Willow flycatcher	<i>Empidonax traillii</i>
Passeriformes	Dusky flycatcher	<i>Empidonax oberholseri</i>
Passeriformes	Hammond's flycatcher	<i>Empidonax hammondi</i>
Passeriformes	Cordilleran flycatcher	<i>Empidonax occidentalis</i>
Passeriformes	Least flycatcher	<i>Empidonax minimus*</i>
Passeriformes	Western wood-peewee	<i>Contopus sordidulus</i>
Passeriformes	Olive-sided flycatcher	<i>Contopus cooperi</i>
Passeriformes	Horned lark	<i>Eremophila alpestris</i>
Passeriformes	Tree swallow	<i>Tachycineta bicolor</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Passeriformes	Violet-green swallow	<i>Tachycineta thalassina</i> *
Passeriformes	Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i> *
Passeriformes	Bank swallow	<i>Riparia riparia</i>
Passeriformes	Cliff swallow	<i>Petrochelidon pyrrhonota</i>
Passeriformes	Barn swallow	<i>Hirundo rustica</i>
Passeriformes	Steller's jay	<i>Cyanocitta stelleri</i>
Passeriformes	Pinyon jay	<i>Gymnorhinus cyanocephalus</i>
Passeriformes	Gray jay	<i>Perisoreus Canadensis</i>
Passeriformes	Blue jay	<i>Cyanocitta cristata</i> *
Passeriformes	Black-billed magpie	<i>Pica hudsonia</i>
Passeriformes	American crow	<i>Corvus brachyrhynchos</i>
Passeriformes	Common raven	<i>Corvus corax</i>
Passeriformes	Clark's nutcracker	<i>Nucifraga columbiana</i>
Passeriformes	Black-capped chickadee	<i>Poecile atricappila</i>
Passeriformes	Mountain chickadee	<i>Poecile gambeli</i>
Passeriformes	American dipper	<i>Cinclus mexicanus</i>
Passeriformes	Red-breasted nuthatch	<i>Sitta canadensis</i>
Passeriformes	White-breasted nuthatch	<i>Sitta carolinensis</i>
Passeriformes	Pygmy nuthatch	<i>Sitta pygmaea</i> *
Passeriformes	Brown creeper	<i>Certhia americana</i>
Passeriformes	House wren	<i>Troglodytes aedon</i>
Passeriformes	Winter wren	<i>Troglodytes troglodytes</i> *
Passeriformes	Rock wren	<i>Salpinctes obsoletus</i>
Passeriformes	Canyon wren	<i>Catherpes mexicanus</i>
Passeriformes	Marsh wren	<i>Cistothorus palustris</i>
Passeriformes	Gray catbird	<i>Dumetella carolinensis</i>
Passeriformes	Northern mockingbird	<i>Mimus polyglottos</i> *
Passeriformes	Sage thrasher	<i>Oreoscoptes montanus</i>
Passeriformes	American robin	<i>Turdus migratorius</i>
Passeriformes	Townsend's solitaire	<i>Myadestes townsendi</i>
Passeriformes	Swainson's thrush	<i>Catharus ustulatus</i>
Passeriformes	Hermit thrush	<i>Catharus guttatus</i>
Passeriformes	Veery	<i>Catharus fuscescens</i>
Passeriformes	Mountain bluebird	<i>Sialia currucoides</i>
Passeriformes	Western bluebird	<i>Sialia mexicana</i>
Passeriformes	Golden-crowned kinglet	<i>Regulus satrapa</i>
Passeriformes	Ruby-crowned kinglet	<i>Regulus calendula</i>
Passeriformes	American pipit	<i>Anthus rubescens</i> *
Passeriformes	Sprague's pipit	<i>Anthus spragueii</i>
Passeriformes	Bohemian waxwing	<i>Bombycilla garrulous</i>
Passeriformes	Cedar waxwing	<i>Bombycilla cedrorum</i>
Passeriformes	Loggerhead shrike	<i>Lanius ludovicianus</i>
Passeriformes	Northern shrike	<i>Lanius excubitor</i>
Passeriformes	European starling	<i>Sturnus vulgaris</i> +
Passeriformes	Warbling vireo	<i>Vireo gilvus</i>
Passeriformes	Cassin's vireo	<i>Vireo cassinii</i>
Passeriformes	Red-eyed vireo	<i>Vireo olivaceus</i> *

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Passeriformes	Tennessee warbler	<i>Vermivora peregrina</i> *
Passeriformes	Orange-crowned warbler	<i>Vermivora celata</i> *
Passeriformes	Yellow warbler	<i>Dendroica petechia</i>
Passeriformes	Yellow-rumped warbler	<i>Dendroica coronata</i>
Passeriformes	Townsend's warbler	<i>Dendroica townsendi</i> *
Passeriformes	Northern waterthrush	<i>Seiurus noveboracensis</i> *
Passeriformes	Common yellowthroat	<i>Geothlypis trichas</i>
Passeriformes	MacGillivray's warbler	<i>Oporornis tolmiei</i>
Passeriformes	Wilson's warbler	<i>Wilsonia pusilla</i>
Passeriformes	Yellow-breasted chat	<i>Icteria virens</i> *
Passeriformes	American redstart	<i>Setophaga ruticilla</i>
Passeriformes	House sparrow	<i>Passer domesticus</i> ⁺
Passeriformes	Bobolink	<i>Dolichonyx oryzivorus</i> *
Passeriformes	Western meadowlark	<i>Sturnella neglecta</i>
Passeriformes	Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>
Passeriformes	Red-winged blackbird	<i>Agelaius phoeniceus</i>
Passeriformes	Brewer's blackbird	<i>Euphagus cyanocephalus</i>
Passeriformes	Common grackle	<i>Quiscalus quiscula</i> *
Passeriformes	Brown-headed cowbird	<i>Molothrus ater</i>
Passeriformes	Bullock's oriole	<i>Icterus bullockii</i> *
Passeriformes	Western tanager	<i>Piranga ludoviciana</i>
Passeriformes	Black-headed grosbeak	<i>Pheucticus melanocephalus</i>
Passeriformes	Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i> *
Passeriformes	Evening grosbeak	<i>Coccothraustes vespertinus</i>
Passeriformes	Lazuli bunting	<i>Passerina amoena</i>
Passeriformes	Cassin's finch	<i>Carpodacus cassinii</i>
Passeriformes	House finch	<i>Carpodacus mexicanus</i> ⁺
Passeriformes	Pine grosbeak	<i>Pinicola enucleator</i>
Passeriformes	Gray-crowned rosy finch	<i>Leucosticte tephrocotis</i>
Passeriformes	Black rosy finch	<i>Leucosticte atrata</i>
Passeriformes	White-winged crossbill	<i>Loxia leucoptera</i> *
Passeriformes	Common redpoll	<i>Carduelis flammea</i>
Passeriformes	Pine siskin	<i>Carduelis pinus</i>
Passeriformes	American goldfinch	<i>Carduelis tristis</i>
Passeriformes	Red crossbill	<i>Loxia curvirostra</i>
Passeriformes	Green-tailed towhee	<i>Pipilo chlorurus</i> *
Passeriformes	Spotted towhee	<i>Pipilo maculatus</i> *
Passeriformes	Savannah sparrow	<i>Passerculus sandwichensis</i>
Passeriformes	Lark bunting	<i>Calamospiza melanocorys</i>
Passeriformes	Vesper sparrow	<i>Poocetes gramineus</i>
Passeriformes	Lark sparrow	<i>Chondestes grammacus</i>
Passeriformes	Dark-eyed junco	<i>Junco hyemalis</i>
Passeriformes	American tree sparrow	<i>Spizella arborea</i>
Passeriformes	Chipping sparrow	<i>Spizella passerina</i>
Passeriformes	Brewer's sparrow	<i>Spizella breweri</i>
Passeriformes	Clay-colored sparrow	<i>Spizella pallida</i> *
Passeriformes	White-crowned sparrow	<i>Zonotrichia leucophrys</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Passeriformes	White-throated sparrow	<i>Zonotrichia albicollis</i> *
Passeriformes	Harris' sparrow	<i>Zonotrichia querula</i> *
Passeriformes	Fox sparrow	<i>Passerelia iliaca</i>
Passeriformes	Song sparrow	<i>Melospiza melodia</i>
Passeriformes	Lincoln sparrow	<i>Melospiza lincolni</i>
Passeriformes	Grasshopper sparrow	<i>Ammodramus savannarum</i>
Passeriformes	Sage sparrow	<i>Amphispiza belli</i> *
Passeriformes	McCown's longspur	<i>Calcarius mccownii</i> *
Passeriformes	Lapland longspur	<i>Calcarius lapponicus</i> *
Passeriformes	Chestnut-collared longspur	<i>Calcarius ornatus</i> *
Passeriformes	Snow bunting	<i>Plectrophenax nivalis</i>

CLASS MAMMALIA

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Insectivora	Masked shrew	<i>Sorex cinereus</i>
Insectivora	Water shrew	<i>Sorex palustris</i>
Chiroptera	Little brown bat	<i>Myotis lucifugus</i>
Chiroptera	Small-footed bat	<i>Myotis leibii</i>
Chiroptera	Hoary bat	<i>Lasiurus cinereus</i>
Chiroptera	Silver-haired bat	<i>Lasionycteris noctivagans</i>
Carnivora	Black bear	<i>Ursus americanus</i>
Carnivora	Grizzly bear	<i>Ursus arctos</i> *
Carnivora	Ermine	<i>Mustela erminea</i>
Carnivora	Long-tailed weasel	<i>Mustela frenata</i>
Carnivora	Mink	<i>Mustela vison</i>
Carnivora	Marten	<i>Martes americana</i>
Carnivora	Fisher	<i>Martes pennanti</i> *
Carnivora	Wolverine	<i>Gulo gulo</i> *
Carnivora	River otter	<i>Lontra canadensis</i>
Carnivora	Badger	<i>Taxidea taxus</i>
Carnivora	Striped skunk	<i>Mephitis mephitis</i>
Carnivora	Raccoon	<i>Procyon lotor</i>
Carnivora	Red fox	<i>Vulpes vulpes</i>
Carnivora	Coyote	<i>Canis latrans</i>
Carnivora	Gray wolf	<i>Canis lupus</i>
Carnivora	Bobcat	<i>Lynx rufus</i>
Carnivora	Canada lynx	<i>Lynx canadensis</i> *
Carnivora	Mountain lion	<i>Puma concolor</i>
Artiodactyla	Moose	<i>Alces alces</i>
Artiodactyla	Pronghorn	<i>Antilocapra americana</i>
Artiodactyla	Bison	<i>Bison bison</i> *
Artiodactyla	Elk	<i>Cervus elaphus</i>
Artiodactyla	Mule deer	<i>Odocoileus hemionus</i>
Artiodactyla	White-tailed deer	<i>Odocoileus virginianus</i>
Artiodactyla	Bighorn sheep	<i>Ovis Canadensis</i> *
Lagomorpha	White-tailed jackrabbit	<i>Lepus townsendii</i>
Lagomorpha	Black-tailed jackrabbit	<i>Lepus californicus</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Lagomorpha	Snowshoe hare	<i>Lepus americanus</i>
Lagomorpha	Pygmy rabbit	<i>Brachylagus idahoensis</i>
Lagomorpha	Pika	<i>Ochotona princeps</i>
Rodentia	Wyoming ground squirrel	<i>Spermophilus elegans</i>
Rodentia	Golden-mantled ground squirrel	<i>Spermophilus lateralis</i>
Rodentia	Northern flying squirrel	<i>Glaucomys sabrihus</i>
Rodentia	Red squirrel	<i>Tamiasciurus hudsonicus</i>
Rodentia	Least chipmunk	<i>Tamias minimus</i>
Rodentia	Yellow-pine chipmunk	<i>Tamias amoenus</i>
Rodentia	Yellow-bellied marmot	<i>Marmota flaviventris</i>
Rodentia	Bushy-tailed woodrat	<i>Neotoma cinerea</i>
Rodentia	Porcupine	<i>Erethizon dorsatum</i>
Rodentia	Northern pocket gopher	<i>Thomomys talpoides</i>
Rodentia	Muskrat	<i>Ondatra zibethicus</i>
Rodentia	Beaver	<i>Castor canadensis</i>
Rodentia	Deer mouse	<i>Peromyscus maniculatus</i>
Rodentia	Western jumping mouse	<i>Zapus princeps</i>
Rodentia	Southern red-backed vole	<i>Clethrionomys gapperi</i>
Rodentia	Meadow vole	<i>Microtus pennsylvanicus</i>
Rodentia	Montane vole	<i>Microtus montanus</i>
Rodentia	Long-tailed vole	<i>Microtus longicaudus</i>

CLASS OSTEICHTHYES

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Cypriniformes	White sucker	<i>Catostomus commersonii</i> ⁺
Cypriniformes	Longnose sucker	<i>Catostomus catostomus</i>
Cypriniformes	Mountain sucker	<i>Catostomus platyrhynchus</i>
Cypriniformes	Longnose dace	<i>Rhinichthys cataractae</i>
Gadiformes	Burbot	<i>Lota lota</i>
Salmoniformes	Arctic grayling	<i>Thymallus arcticus</i>
Salmoniformes	Mountain whitefish	<i>Prosopium williamsoni</i>
Salmoniformes	Westslope cutthroat trout	<i>Oncorhynchus clarkii lewisi</i>
Salmoniformes	Yellowstone cutthroat trout	<i>Oncorhynchus clarkii bowvieri</i> ⁺
Salmoniformes	Rainbow trout	<i>Oncorhynchus mykiss</i> ⁺
Salmoniformes	Brook trout	<i>Salvelinus fontinalis</i> ⁺
Scorpaeniformes	Mottled sculpin	<i>Cottus bairdii</i>

PLANTS**CLASS PINOPIPSIDA**

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Pinales	Subalpine fir	<i>Abies lasiocarpa</i>
Pinales	Engelmann spruce	<i>Picea engelmannii</i>
Pinales	Whitebark pine	<i>Pinus albicaulis</i>
Pinales	Lodgepole pine	<i>Pinus contorta</i>
Pinales	Limber pine	<i>Pinus flexilis</i>
Pinales	Douglas-fir	<i>Pseudotsuga menziesii</i>
Pinales	Rocky Mountain juniper	<i>Juniperus scopulorum</i>
Pinales	Common juniper	<i>Juniperus communis</i>
Pinales	Creeping juniper	<i>Juniperus horizontalis</i>

CLASS MAGNOLIOPSIDA

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Salicales	Balsam poplar	<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>
Salicales	Quaking aspen	<i>Populus tremuloides</i>
Salicales	Bebb willow	<i>Salix bebbiana</i>
Salicales	Booth's willow	<i>Salix boothii</i>
Salicales	Sageleaf willow	<i>Salix candida</i>
Salicales	Drummond's willow	<i>Salix drummondiana</i>
Salicales	Geyer willow	<i>Salix geyeriana</i>
Salicales	Grayleaf willow	<i>Salix glauca</i>
Salicales	Pacific willow	<i>Salix lucida</i> ssp. <i>lasiandra</i>
Salicales	Yellow willow	<i>Salix lutea</i>
Salicales	Blueberry willow	<i>Salix myrtilifolia</i>
Salicales	Diamondleaf willow	<i>Salix planifolia</i>
Salicales	False mountain willow	<i>Salix pseudomonticola</i>
Salicales	Scouler's willow	<i>Salix scouleriana</i>
Salicales	Wolf's willow	<i>Salix wolfii</i>
Sapindales	Rocky Mountain maple	<i>Acer glabrum</i>
Asterales	Little sagebrush	<i>Artemisia arbuscula</i> ssp. <i>arbuscula</i>
Asterales	Alkali sagebrush	<i>Artemisia arbuscula</i> ssp. <i>longiloba</i>
Asterales	Silver sagebrush	<i>Artemisia cana</i> ssp. <i>viscidula</i>
Asterales	Prairie sagewort	<i>Artemisia frigida</i>
Asterales	Basin big sagebrush	<i>Artemisia tridentata</i> ssp. <i>tridentata</i>
Asterales	Mountain big sagebrush	<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>
Asterales	Threetip sagebrush	<i>Artemisia tripartita</i> ssp. <i>tripartita</i>
Asterales	Green rabbitbrush	<i>Chrysothamnus viscidiflorus</i>
Asterales	Whitestem goldenbush	<i>Ericameria discoidea</i>
Asterales	Rubber rabbitbrush	<i>Ericameria nauseosa</i>
Asterales	Dwarf goldenbush	<i>Ericameria nana</i>
Asterales	Singlehead goldenbush	<i>Ericameria suffruticosa</i>
Asterales	Spineless horsebrush	<i>Tetradymia canescens</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Asterales	Common yarrow	<i>Achillea millefolium</i>
Asterales	Orange agoseris	<i>Agoseris aurantiaca</i>
Asterales	Pale agoseris	<i>Agoseris glauca</i>
Asterales	Western pearly everlasting	<i>Anaphalis margaritacea</i>
Asterales	Alpine pussytoes	<i>Antennaria alpina</i>
Asterales	Pearly pussytoes	<i>Antennaria anaphaloides</i>
Asterales	Flat-top pussytoes	<i>Antennaria corymbosa</i>
Asterales	Rush pussytoes	<i>Antennaria luzuloides</i>
Asterales	Littleleaf pussytoes	<i>Antennaria microphylla</i>
Asterales	Raceme pussytoes	<i>Antennaria racemosa</i>
Asterales	Rosy pussytoes	<i>Antennaria rosea</i>
Asterales	Chamisso arnica	<i>Arnica chamissonis</i>
Asterales	Heartleaf arnica	<i>Arnica cordifolia</i>
Asterales	Broadleaf arnica	<i>Arnica latifolia</i>
Asterales	Hairy arnica	<i>Arnica mollis</i>
Asterales	Twin arnica	<i>Arnica sororia</i>
Asterales	Biennial wormwood	<i>Artemisia biennis</i>
Asterales	Tarragon	<i>Artemisia dracuncululus</i>
Asterales	White sagebrush	<i>Artemisia ludoviciana</i>
Asterales	Arrowleaf balsamroot	<i>Balsamorhiza sagittata</i>
Asterales	Nodding beggartick	<i>Bidens cernua</i>
Asterales	Musk thistle	<i>Carduus nutans</i> ⁺
Asterales	Spotted knapweed	<i>Centaurea stoebe</i> ⁺
Asterales	Douglas' dustymaiden	<i>Chaenactis douglasii</i>
Asterales	Canada thistle	<i>Cirsium arvense</i> ⁺
Asterales	Graygreen thistle	<i>Cirsium canovirens</i>
Asterales	Meadow thistle	<i>Cirsium scariosum</i>
Asterales	Wavyleaf thistle	<i>Cirsium undulatum</i>
Asterales	Bull thistle	<i>Cirsium vulgare</i> ⁺
Asterales	Tapertip hawksbeard	<i>Crepis acuminata</i>
Asterales	Fiddleleaf hawksbeard	<i>Crepis runcinata</i>
Asterales	Giant sumpweed	<i>Cyclachaena xanthifolia</i>
Asterales	Tufted fleabane	<i>Erigeron caespitosus</i>
Asterales	Cutleaf daisy	<i>Erigeron compositus</i>
Asterales	Longleaf fleabane	<i>Erigeron corymbosus</i>
Asterales	Streamside fleabane	<i>Erigeron glabellus</i>
Asterales	Quill fleabane	<i>Erigeron gracilis</i>
Asterales	Shortray fleabane	<i>Erigeron lonchophyllus</i>
Asterales	Buff fleabane	<i>Erigeron ochroleucus</i>
Asterales	Philadelphia fleabane	<i>Erigeron philadelphicus</i>
Asterales	Subalpine fleabane	<i>Erigeron peregrinus</i>
Asterales	Rydberg's fleabane	<i>Erigeron rydbergii</i>
Asterales	Aspen fleabane	<i>Erigeron speciosus</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Asterales	Tweedy's fleabane	<i>Erigeron tweedyi</i>
Asterales	Common woolly sunflower	<i>Eriophyllum lanatum</i>
Asterales	Elegant aster	<i>Eucephalus elegans</i>
Asterales	Engelmann's aster	<i>Eucephalus engelmannii</i>
Asterales	Western showy aster	<i>Eurybia conspicua</i>
Asterales	Thickstem aster	<i>Eurybia integrifolia</i>
Asterales	Common gaillardia	<i>Gaillardia aristata</i>
Asterales	Western marsh cudweed	<i>Gnaphalium palustre</i>
Asterales	Curlycup gumweed	<i>Grindelia squarrosa</i>
Asterales	Oneflower helianthella	<i>Helianthella uniflora</i>
Asterales	Common sunflower	<i>Helianthus annuus</i>
Asterales	Nuttall's sunflower	<i>Helianthus nuttallii</i>
Asterales	Showy goldeneye	<i>Heliomeris multiflora</i>
Asterales	White hawkweed	<i>Hieracium albiflorum</i>
Asterales	Houndstongue hawkweed	<i>Hieracium cynoglossoides</i>
Asterales	Slender hawkweed	<i>Hieracium gracile</i>
Asterales	Fineleaf hymenopappus	<i>Hymenopappus filifolius</i>
Asterales	Owl's-claws	<i>Hymenoxys hoopesii</i>
Asterales	Lava aster	<i>Ionactis alpina</i>
Asterales	Tall blue lettuce	<i>Lactuca biennis</i>
Asterales	Blue lettuce	<i>Lactuca tatarica</i>
Asterales	Hoary tansyaster	<i>Machaeranthera canescens</i>
Asterales	Mountain tarweed	<i>Madia glomerata</i>
Asterales	Disc mayweed	<i>Matricaria discoidea</i>
Asterales	Nodding microseris	<i>Microseris nutans</i>
Asterales	Meadow prairie-dandelion	<i>Nothocalais nigrescens</i>
Asterales	Woolly groundsel	<i>Packera cana</i>
Asterales	Weak groundsel	<i>Packera debilis</i>
Asterales	Elegant groundsel	<i>Packera indecora</i>
Asterales	Balsam groundsel	<i>Packera paupercula</i>
Asterales	Falsegold groundsel	<i>Packera pseud aurea</i>
Asterales	Rocky Mountain groundsel	<i>Packera streptanthifolia</i>
Asterales	Hoary groundsel	<i>Packera wernerifolia</i>
Asterales	Arctic sweet coltsfoot	<i>Petasites frigidus</i>
Asterales	Many-stemmed goldenweed	<i>Pyrocoma integrifolia</i>
Asterales	Lanceleaf goldenweed	<i>Pyrocoma lanceolata</i>
Asterales	Plantain goldenweed	<i>Pyrocoma uniflora</i>
Asterales	Western coneflower	<i>Rudbeckia occidentalis</i>
Asterales	Thickleaf ragwort	<i>Senecio crassulus</i>
Asterales	Dwarf mountain ragwort	<i>Senecio fremontii</i>
Asterales	Tall ragwort	<i>Senecio hydrophiloides</i>
Asterales	Water ragwort	<i>Senecio hydrophilus</i>
Asterales	Lambstongue ragwort	<i>Senecio integerrimus</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Asterales	Small blacktip ragwort	<i>Senecio lugens</i>
Asterales	Tall ragwort	<i>Senecio serra</i>
Asterales	Ballhead ragwort	<i>Senecio sphaerocephalus</i>
Asterales	Arrowleaf ragwort	<i>Senecio triangularis</i>
Asterales	Canada goldenrod	<i>Solidago canadensis</i>
Asterales	Missouri goldenrod	<i>Solidago missouriensis</i>
Asterales	Manyray goldenrod	<i>Solidago multiradiata</i>
Asterales	Gray goldenrod	<i>Solidago nemoralis</i>
Asterales	Dwarf goldenrod	<i>Solidago simplex</i>
Asterales	Moist sowthistle	<i>Sonchus arvensis</i> ⁺
Asterales	Stemless mock goldenweed	<i>Stenotus acaulis</i>
Asterales	Woolly mock goldenweed	<i>Stenotus lanuginosus</i>
Asterales	Narrowleaf wirelettuce	<i>Stephanomeria minor</i>
Asterales	Western meadow aster	<i>Symphotrichum campestre</i>
Asterales	Eaton's aster	<i>Symphotrichum eatonii</i>
Asterales	White prairie aster	<i>Symphotrichum falcatum</i>
Asterales	Alpine leafybract aster	<i>Symphotrichum foliaceum</i>
Asterales	White panicle aster	<i>Symphotrichum lanceolatum</i>
Asterales	Western mountain aster	<i>Symphotrichum spathulatum</i>
Asterales	Common tansy	<i>Tanacetum vulgare</i> ⁺
Asterales	Rock dandelion	<i>Taraxacum laevigatum</i> ⁺
Asterales	Common dandelion	<i>Taraxacum officinale</i> ⁺
Asterales	Graylocks four-nerve daisy	<i>Tetranneuris grandiflora</i>
Asterales	Wyoming Townsend daisy	<i>Townsendia alpigena</i>
Asterales	Cushion Townsend daisy	<i>Townsendia condensata</i>
Asterales	Parry's Townsend daisy	<i>Townsendia parryi</i>
Asterales	Yellow salsify	<i>Tragopogon dubius</i> ⁺
Asterales	Jack-to-bed-at-noon	<i>Tragopogon lamottei</i> ⁺
Asterales	Mule-ears	<i>Wyethia amplexicaulis</i>
Asterales	Sunflower mule-ears	<i>Wyethia helianthoides</i>
Fagales	Bog birch	<i>Betula pumila</i>
Caryophyllales	Brittle pricklypear	<i>Opuntia fragilis</i>
Caryophyllales	Greasewood	<i>Sarcobatus vermiculatus</i>
Dipsacales	Twinberry honeysuckle	<i>Lonicera involucrata</i>
Dipsacales	Utah honeysuckle	<i>Lonicera utahensis</i>
Dipsacales	Red elderberry	<i>Sambucus racemosa</i>
Dipsacales	Mountain snowberry	<i>Symphoricarpos oreophilus</i>
Dipsacales	Squashberry	<i>Viburnum edule</i>
Dipsacales	Twinflower	<i>Linnaea borealis</i>
Dipsacales	Tobacco root	<i>Valeriana edulis</i>
Dipsacales	Western valerian	<i>Valeriana occidentalis</i>
Cornales	Redosier dogwood	<i>Cornus sericea</i>
Cornales	Bunchberry dogwood	<i>Cornus canadensis</i>

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Rhamnales	Russet buffaloberry	<i>Shepherdia canadensis</i>
Rhamnales	Alderleaf buckthorn	<i>Rhamnus alnifolia</i>
Ericales	Kinnikinnick	<i>Arctostaphylos uva-ursi</i>
Ericales	Thinleaf huckleberry	<i>Vaccinium membranaceum</i>
Ericales	Grouse whortleberry	<i>Vaccinium scoparium</i>
Ericales	Pipsissewa	<i>Chimaphila umbellata</i>
Ericales	Sidebells wintergreen	<i>Orthilia secunda</i>
Ericales	Liverleaf wintergreen	<i>Pyrola asarifolia</i>
Ericales	Single delight	<i>Moneses uniflora</i>
Ericales	Greenflowered wintergreen	<i>Pyrola chlorantha</i>
Fabales	Siberian peashrub	<i>Caragana arborescens</i> ⁺
Fabales	Purple milkvetch	<i>Astragalus agrestis</i>
Fabales	Alpine milkvetch	<i>Astragalus alpinus</i>
Fabales	American milkvetch	<i>Astragalus americanus</i>
Fabales	Silverleaf milkvetch	<i>Astragalus argophyllus</i>
Fabales	Canadian milkvetch	<i>Astragalus canadensis</i>
Fabales	Browse milkvetch	<i>Astragalus cibarius</i>
Fabales	Drummond's milkvetch	<i>Astragalus drummondii</i>
Fabales	Elegant milkvetch	<i>Astragalus eucosmus</i>
Fabales	Flexile milkvetch	<i>Astragalus flexuosus</i>
Fabales	Bent milkvetch	<i>Astragalus inflexus</i>
Fabales	Spiny milkvetch	<i>Astragalus kentrophyta</i>
Fabales	Prairie milkvetch	<i>Astragalus laxmannii</i>
Fabales	Freckled milkvetch	<i>Astragalus lentiginosus</i>
Fabales	Park milkvetch	<i>Astragalus leptaleus</i>
Fabales	Timber milkvetch	<i>Astragalus miser</i>
Fabales	Woollypod milkvetch	<i>Astragalus purshii</i>
Fabales	Railhead milkvetch	<i>Astragalus terminalis</i>
Fabales	Bentflower milkvetch	<i>Astragalus vexilliflexus</i>
Fabales	Utah sweetvetch	<i>Hedysarum boreale</i>
Fabales	White sweetvetch	<i>Hedysarum sulphurescens</i>
Fabales	Silvery lupine	<i>Lupinus argenteus</i>
Fabales	Velvet lupine	<i>Lupinus leucophyllus</i>
Fabales	Bigleaf lupine	<i>Lupinus polyphyllus</i>
Fabales	Silky lupine	<i>Lupinus sericeus</i>
Fabales	Yellow sweetclover	<i>Melilotus officinalis</i> ⁺
Fabales	Nodding locoweed	<i>Oxytropis deflexa</i>
Fabales	Haresfoot locoweed	<i>Oxytropis lagopus</i>
Fabales	White locoweed	<i>Oxytropis sericea</i>
Fabales	Slimflower scurfpea	<i>Psoralidium tenuiflorum</i>
Fabales	Alsike clover	<i>Trifolium hybridum</i> ⁺
Fabales	Longstalk clover	<i>Trifolium longipes</i>
Fabales	Red clover	<i>Trifolium pratense</i> ⁺

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Fabales	White clover	<i>Trifolium repens</i> ⁺
Fabales	American vetch	<i>Vicia americana</i>
Rosales	Wax currant	<i>Ribes cereum</i>
Rosales	Northern black currant	<i>Ribes hudsonianum</i>
Rosales	Whitestem gooseberry	<i>Ribes inerme</i>
Rosales	Gooseberry currant	<i>Ribes montigenum</i>
Rosales	Inland gooseberry	<i>Ribes oxycanthoides</i>
Rosales	Sticky currant	<i>Ribes viscosissimum</i>
Rosales	Shrubby cinquefoil	<i>Dasiphora fruticosa</i>
Rosales	Mat rockspirea	<i>Petrophyton caespitosum</i>
Rosales	Chokecherry	<i>Prunus virginiana</i>
Rosales	Woods' rose	<i>Rosa woodsii</i>
Rosales	American red raspberry	<i>Rubus idaeus</i>
Rosales	Thimbleberry	<i>Rubus parviflorus</i>
Rosales	Greene's mountain ash	<i>Sorbus scopulina</i>
Rosales	White spirea	<i>Spiraea betulifolia</i>
Rosales	Ledge stonecrop	<i>Rhodiola integrifolia</i>
Rosales	Redpod stonecrop	<i>Rhodiola rhodantha</i>
Rosales	Leiberg stonecrop	<i>Sedum leibergii</i>
Rosales	Spearleaf stonecrop	<i>Sedum lanceolatum</i>
Rosales	Silverweed cinquefoil	<i>Argentina anserina</i>
Rosales	Virginia strawberry	<i>Fragaria virginiana</i>
Rosales	Largeleaf avens	<i>Geum macrophyllum</i>
Rosales	Old man's whiskers	<i>Geum triflorum</i>
Rosales	Gordon's ivesia	<i>Ivesia gordonii</i>
Rosales	Varileaf cinquefoil	<i>Potentilla diversifolia</i>
Rosales	Sticky cinquefoil	<i>Potentilla glandulosa</i>
Rosales	Slender cinquefoil	<i>Potentilla gracilis</i>
Rosales	Sheep cinquefoil	<i>Potentilla ovina</i>
Rosales	Platte River cinquefoil	<i>Potentilla plattensis</i>
Rosales	Roundleaf alumroot	<i>Heuchera cylindrica</i>
Rosales	Smallflower woodland-star	<i>Lithophragma parviflorum</i>
Rosales	Smallflower miterwort	<i>Mitella stauropetala</i>
Rosales	Fringed grass of Parnassus	<i>Parnassia fimbriata</i>
Rosales	Smallflower grass of Parnassus	<i>Parnassia palustris</i>
Rosales	Yellowdot saxifrage	<i>Saxifraga bronchialis</i>
Rosales	Brook saxifrage	<i>Saxifraga odontoloma</i>
Rosales	Diamondleaf saxifrage	<i>Saxifraga rhomboidea</i>
Solanales	Granite prickly phlox	<i>Linanthus pungens</i>
Solanales	Dwarf hesperochiron	<i>Hesperochiron pumilus</i>
Solanales	Ballhead waterleaf	<i>Hydrophyllum capitatum</i>
Solanales	Basin nemophila	<i>Nemophila breviflora</i>
Solanales	Franklin's phacelia	<i>Phacelia franklinii</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Solanales	Silverleaf phacelia	<i>Phacelia hastata</i>
Solanales	Silky phacelia	<i>Phacelia sericea</i>
Solanales	Tiny trumpet	<i>Collomia linearis</i>
Solanales	Spiny phlox	<i>Phlox hoodii</i>
Solanales	Kelsey's phlox	<i>Phlox kelseyi</i>
Solanales	Longleaf phlox	<i>Phlox longifolia</i>
Solanales	Western polemonium	<i>Polemonium occidentale</i>
Solanales	Jacob's-ladder	<i>Polemonium pulcherrimum</i>
Solanales	Sticky polemonium	<i>Polemonium viscosum</i>
Solanales	Black henbane	<i>Hyoscyamus niger</i> ⁺
Scrophulariales	Bush penstemon	<i>Penstemon fruticosus</i>
Scrophulariales	Flat-top broomrape	<i>Orobanche corymbosa</i>
Scrophulariales	Clustered broomrape	<i>Orobanche fasciculata</i>
Scrophulariales	Louisiana broomrape	<i>Orobanche ludoviciana</i>
Scrophulariales	Wyoming besseya	<i>Besseya wyomingensis</i>
Scrophulariales	Yellow Indian paintbrush	<i>Castilleja flava</i>
Scrophulariales	Giant red Indian paintbrush	<i>Castilleja miniata</i>
Scrophulariales	Sulphur Indian paintbrush	<i>Castilleja sulphurea</i>
Scrophulariales	Maiden blue eyed Mary	<i>Collinsia parviflora</i>
Scrophulariales	Water mudwort	<i>Limosella aquatica</i>
Scrophulariales	Seep monkeyflower	<i>Mimulus guttatus</i>
Scrophulariales	Yellow owl's-clover	<i>Orthocarpus luteus</i>
Scrophulariales	Field locoweed	<i>Oxytropis campestris</i>
Scrophulariales	Elephanthead lousewort	<i>Pedicularis groenlandica</i>
Scrophulariales	Parry's lousewort	<i>Pedicularis parryi</i>
Scrophulariales	Sicketop lousewort	<i>Pedicularis racemosa</i>
Scrophulariales	Sulphur penstemon	<i>Penstemon attenuatus</i>
Scrophulariales	Cordroot beardtongue	<i>Penstemon montanus</i>
Scrophulariales	Matroot penstemon	<i>Penstemon radicosus</i>
Scrophulariales	Rydberg's penstemon	<i>Penstemon rydbergii</i>
Scrophulariales	American speedwell	<i>Veronica americana</i>
Scrophulariales	American alpine speedwell	<i>Veronica wormskjoldii</i>
Scrophulariales	Common bladderwort	<i>Utricularia macrorhiza</i>
Alismatales	Arumleaf arrowhead	<i>Sagittaria cuneata</i>
Apiales	Lyall's angelica	<i>Angelica arguta</i>
Apiales	Small-leaf angelica	<i>Angelica pinnata</i>
Apiales	American thorum wax	<i>Bupleurum americanum</i>
Apiales	Western water hemlock	<i>Cicuta douglasii</i>
Apiales	Plains springparsley	<i>Cymopterus acaulis</i>
Apiales	Snowline springparsley	<i>Cymopterus nivalis</i>
Apiales	Common cowparsnip	<i>Heracleum maximum</i>
Apiales	Fernleaf licorice-root	<i>Ligusticum filicinum</i>
Apiales	Wyeth biscuitroot	<i>Lomatium ambiguum</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Apiales	Cous biscuitroot	<i>Lomatium cous</i>
Apiales	Desert biscuitroot	<i>Lomatium foeniculaceum</i>
Apiales	Bigseed biscuitroot	<i>Lomatium macrocarpum</i>
Apiales	Nineleaf biscuitroot	<i>Lomatium triternatum</i>
Apiales	Leafy wildparsley	<i>Musineon divaricatum</i>
Apiales	Sweetcicely	<i>Osmorhiza berteroi</i>
Apiales	Bluntseed sweetroot	<i>Osmorhiza depauperata</i>
Apiales	Western sweetroot	<i>Osmorhiza occidentalis</i>
Apiales	Gardner's yampah	<i>Perideridia gairdneri</i>
Apiales	Henderson's wavewing	<i>Pteryxia hendersonii</i>
Apiales	Hemlock waterparsnip	<i>Sium suave</i>
Apiales	Meadow zizia	<i>Zizia aptera</i>
Lamiales	Sanddune cryptantha	<i>Cryptantha fendleri</i>
Lamiales	Roundspike cryptantha	<i>Cryptantha humilis</i>
Lamiales	Torrey's cryptantha	<i>Cryptantha torreyana</i>
Lamiales	Watson's cryptantha	<i>Cryptantha watsonii</i>
Lamiales	Gypsyflower	<i>Cynoglossum officinale</i>
Lamiales	Manyflower stickseed	<i>Hackelia floribunda</i>
Lamiales	Jessica sticktight	<i>Hackelia micrantha</i>
Lamiales	Spotted stickseed	<i>Hackelia patens</i>
Lamiales	Flatspine stickseed	<i>Lappula occidentalis</i>
Lamiales	Narrowleaf stoneseed	<i>Lithospermum incisum</i>
Lamiales	Western stoneseed	<i>Lithospermum ruderale</i>
Lamiales	Tall fringed bluebells	<i>Mertensia ciliata</i>
Lamiales	Oblongleaf bluebells	<i>Mertensia oblongifolia</i>
Lamiales	Tall bluebells	<i>Mertensia paniculata</i>
Lamiales	Asian forget-me-not	<i>Myosotis asiatica</i>
Lamiales	True forget-me-not	<i>Myosotis scorpioides</i>
Lamiales	Sleeping popcornflower	<i>Plagiobothrys scouleri</i>
Lamiales	Nettleleaf giant hyssop	<i>Agastache urticifolia</i>
Lamiales	Wild mint	<i>Mentha arvensis</i>
Lamiales	Common selfheal	<i>Prunella vulgaris</i>
Lamiales	Marsh skullcap	<i>Scutellaria galericulata</i>
Lamiales	Marsh hedgenettle	<i>Stachys palustris</i>
Capparales	Pale madwort	<i>Alyssum alyssoides</i> ⁺
Capparales	Desert madwort	<i>Alyssum desertorum</i>
Capparales	Spreadingpod rockcress	<i>Arabis xdivaricarpa</i>
Capparales	Hairy rockcress	<i>Arabis hirsuta</i>
Capparales	Collins' rockcress	<i>Arabis holboellii</i>
Capparales	Lemmon's rockcress	<i>Arabis lemmonii</i>
Capparales	Littleleaf rockcress	<i>Arabis microphylla</i>
Capparales	Nuttall's rockcress	<i>Arabis nuttallii</i>
Capparales	Sicklepod rockcress	<i>Arabis sparsiflora</i>

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Capparales	American yellowrocket	<i>Barbarea orthoceras</i>
Capparales	Littlepod false flax	<i>Camelina microcarpa</i>
Capparales	Shepherd's purse	<i>Capsella bursa-pastoris</i> ⁺
Capparales	Brewer's bittercress	<i>Cardamine breweri</i>
Capparales	Crossflower	<i>Chorispota tenella</i>
Capparales	Mountain tansymustard	<i>Descurainia incana</i>
Capparales	Western tansymustard	<i>Descurainia pinnata</i>
Capparales	Herb sophia	<i>Descurainia sophia</i> ⁺
Capparales	Golden draba	<i>Draba aurea</i>
Capparales	Cushion draba	<i>Draba breweri</i>
Capparales	Snowbed draba	<i>Draba crassifolia</i>
Capparales	Lancepod draba	<i>Draba lonchocarpa</i>
Capparales	Woodland draba	<i>Draba nemorosa</i>
Capparales	Fewseed draba	<i>Draba oligosperma</i>
Capparales	Payson's draba	<i>Draba paysonii</i>
Capparales	Western wallflower	<i>Erysimum asperum</i>
Capparales	Wormseed wallflower	<i>Erysimum cheiranthoides</i> ⁺
Capparales	Shy wallflower	<i>Erysimum inconspicuum</i>
Capparales	Common pepperweed	<i>Lepidium densiflorum</i>
Capparales	Mountain pepperweed	<i>Lepidium montanum</i>
Capparales	Clasping pepperweed	<i>Lepidium perfoliatum</i> ⁺
Capparales	Virginia pepperweed	<i>Lepidium virginicum</i>
Capparales	Idaho bladderpod	<i>Lesquerella carinata</i>
Capparales	Onerow yellowcress	<i>Nasturtium microphyllum</i> ⁺
Capparales	Watercress	<i>Nasturtium officinale</i> ⁺
Capparales	Meadow pennycress	<i>Noccaea parviflora</i>
Capparales	Common twinpod	<i>Physaria didymocarpa</i>
Capparales	Curvepod yellowcress	<i>Rorippa curvisiliqua</i>
Capparales	Bog yellowcress	<i>Rorippa palustris</i>
Capparales	Small tumbleweed mustard	<i>Sisymbrium loeselii</i> ⁺
Capparales	Alpine smelowskia	<i>Smelowskia calycina</i>
Capparales	Northwestern thelypody	<i>Thelypodium paniculatum</i>
Capparales	Arrow thelypody	<i>Thelypodium sagittatum</i>
Capparales	Field pennycress	<i>Thlaspi arvense</i>
Campanulales	Bluebell bellflower	<i>Campanula rotundifolia</i>
Campanulales	Great Basin calicoflower	<i>Downingia laeta</i>
Caryophyllales	Slender mountain sandwort	<i>Arenaria capillaris</i>
Caryophyllales	Ballhead sandwort	<i>Arenaria congesta</i>
Caryophyllales	Field chickweed	<i>Cerastium arvense</i>
Caryophyllales	Bering chickweed	<i>Cerastium beeringianum</i>
Caryophyllales	Big chickweed	<i>Cerastium fontanum</i>
Caryophyllales	Nuttall's sandwort	<i>Minuartia nuttallii</i>
Caryophyllales	Twinflower sandwort	<i>Minuartia obtusiloba</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Caryophyllales	Beautiful sandwort	<i>Minuartia rubella</i>
Caryophyllales	Bluntleaf sandwort	<i>Moehringia lateriflora</i>
Caryophyllales	Tuber starwort	<i>Pseudostellaria jamesiana</i>
Caryophyllales	Western pearlwort	<i>Sagina decumbens</i>
Caryophyllales	Moss campion	<i>Silene acaulis</i>
Caryophyllales	Bladder campion	<i>Silene latifolia</i> ⁺
Caryophyllales	Menzies' campion	<i>Silene menziesii</i>
Caryophyllales	Nightflowering silene	<i>Silene noctiflora</i> ⁺
Caryophyllales	Parry's silene	<i>Silene parryi</i>
Caryophyllales	Northern starwort	<i>Stellaria calycantha</i>
Caryophyllales	Fleshy starwort	<i>Stellaria crassifolia</i>
Caryophyllales	Curled starwort	<i>Stellaria crispa</i>
Caryophyllales	Longleaf starwort	<i>Stellaria longifolia</i>
Caryophyllales	Longstalk starwort	<i>Stellaria longipes</i>
Caryophyllales	Rocky Mountain chickweed	<i>Stellaria obtusa</i>
Caryophyllales	Spear saltbrush	<i>Atriplex patula</i>
Caryophyllales	Wedgescale saltbush	<i>Atriplex truncata</i>
Caryophyllales	Lambsquarters	<i>Chenopodium album</i> ⁺
Caryophyllales	Blite goosefoot	<i>Chenopodium capitatum</i>
Caryophyllales	Oakleaf goosefoot	<i>Chenopodium glaucum</i> ⁺
Caryophyllales	Red goosefoot	<i>Chenopodium rubrum</i>
Caryophyllales	Nuttall's povertyweed	<i>Monolepis nuttalliana</i>
Caryophyllales	Red swampfire	<i>Salicornia rubra</i>
Caryophyllales	Lanceleaf springbeauty	<i>Claytonia lanceolata</i>
Caryophyllales	Bitter root	<i>Lewisia rediviva</i>
Caryophyllales	Water minerslettuce	<i>Montia chamissoi</i>
Papaverales	Scrambled eggs	<i>Corydalis aurea</i>
Gentianales	Elkweed	<i>Frasera speciosa</i>
Gentianales	Pleated gentian	<i>Gentiana affinis</i>
Gentianales	Moss gentian	<i>Gentiana fremontii</i>
Gentianales	Autumn dwarf gentian	<i>Gentianella amarella</i>
Gentianales	Oneflower fringed gentian	<i>Gentianopsis simplex</i>
Gentianales	Felwort	<i>Swertia perennis</i>
Geraniales	Richardson's geranium	<i>Geranium richardsonii</i>
Geraniales	Sticky geranium	<i>Geranium viscosissimum</i>
Malvales	Streambank wild hollyhock	<i>Iliamna rivularis</i>
Myrtales	Fireweed	<i>Chamerion angustifolium</i>
Myrtales	Tall annual willowherb	<i>Epilobium brachycarpum</i>
Myrtales	Fringed willowherb	<i>Epilobium ciliatum</i>
Myrtales	Glaucus willowherb	<i>Epilobium glaberrimum</i>
Myrtales	Hornemann's willowherb	<i>Epilobium hornemannii</i>
Myrtales	Marsh willowherb	<i>Epilobium palustre</i>
Myrtales	Spreading groundsmoke	<i>Gayophytum diffusum</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Myrtales	Dwarf groundsmoke	<i>Gayophytum humile</i>
Myrtales	Tufted evening-primrose	<i>Oenothera caespitosa</i>
Myrtales	Yellow evening-primrose	<i>Oenothera flava</i>
Myrtales	Pale evening-primrose	<i>Oenothera pallida</i>
Myrtales	Idaho pale evening-primrose	<i>Oenothera pallida</i> ssp. <i>pallida</i>
Plantaginales	Common plantain	<i>Plantago major</i>
Plantaginales	Tweedy's plantain	<i>Plantago tweedyi</i>
Polygonales	Matted buckwheat	<i>Eriogonum caespitosum</i>
Polygonales	Cushion buckwheat	<i>Eriogonum ovalifolium</i>
Polygonales	Sulphur-flower buckwheat	<i>Eriogonum umbellatum</i>
Polygonales	Alpine mountainsorrel	<i>Oxyria digyna</i>
Polygonales	American bistort	<i>Polygonum bistortoides</i>
Polygonales	Douglas' knotweed	<i>Polygonum douglasii</i>
Polygonales	Curlytop knotweed	<i>Polygonum lapathifolium</i>
Polygonales	Western dock	<i>Rumex aquaticus</i>
Polygonales	Alpine sheep sorrel	<i>Rumex paucifolius</i>
Polygonales	Water knotweed	<i>Polygonum amphibium</i>
Primulales	Pygmyflower rockjasmine	<i>Androsace septentrionalis</i>
Primulales	Darkthroat shootingstar	<i>Dodecatheon pulchellum</i>
Primulales	Silvery primrose	<i>Primula incana</i>
Ranunculales	Red baneberry	<i>Actaea rubra</i>
Ranunculales	Little Belt Mountain thimbleweed	<i>Anemone lithophila</i>
Ranunculales	Pacific anemone	<i>Anemone multifida</i>
Ranunculales	Yellow columbine	<i>Aquilegia flavescens</i>
Ranunculales	Western columbine	<i>Aquilegia formosa</i>
Ranunculales	Hairy clematis	<i>Clematis hirsutissima</i>
Ranunculales	Duncecap larkspur	<i>Delphinium occidentale</i>
Ranunculales	Little larkspur	<i>Delphinium bicolor</i>
Ranunculales	Twolobe larkspur	<i>Delphinium nuttallianum</i>
Ranunculales	Eastern pasqueflower	<i>Pulsatilla patens</i>
Ranunculales	Sharpleaf buttercup	<i>Ranunculus acriformis</i>
Ranunculales	Alkali buttercup	<i>Ranunculus cymbalaria</i>
Ranunculales	Sagebrush buttercup	<i>Ranunculus glaberrimus</i>
Ranunculales	Gmelin's buttercup	<i>Ranunculus gmelinii</i>
Ranunculales	High northern buttercup	<i>Ranunculus hyperboreus</i>
Ranunculales	Graceful buttercup	<i>Ranunculus inamoenus</i>
Ranunculales	Cursed buttercup	<i>Ranunculus sceleratus</i>
Ranunculales	Longbeak buttercup	<i>Ranunculus longirostris</i>
Ranunculales	Fendler's meadow-rue	<i>Thalictrum fendleri</i>
Ranunculales	Western meadow-rue	<i>Thalictrum occidentale</i>
Ranunculales	Veiny meadow-rue	<i>Thalictrum venulosum</i>
Ranunculales	Creeping barberry	<i>Mahonia repens</i>
Rubiales	Northern bedstraw	<i>Galium boreale</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Rubiales	Fragrant bedstraw	<i>Galium triflorum</i>
Santalales	Bastard toadflax	<i>Comandra umbellata</i>
Urticales	Stinging nettle	<i>Urtica dioica</i>
Violales	Hookedspur violet	<i>Viola adunca</i>
Violales	Northern bog violet	<i>Viola nephrophylla</i>
Violales	Goosefoot violet	<i>Viola purpurea</i>
Callitrichales	Northern water-starwort	<i>Callitriche hermaphroditica</i>
Callitrichales	Vernal water-starwort	<i>Callitriche palustris</i>
Callitrichales	Common mare's-tail	<i>Hippuris vulgaris</i>
Nymphaeales	Coon's tail	<i>Ceratophyllum demersum</i>
Haloragales	Shortspike watermilfoil	<i>Myriophyllum sibiricum</i>
Linales	Lewis flax	<i>Linum lewisii</i>

CLASS LILIOPSIDA

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Najadales	Seaside arrowgrass	<i>Triglochin maritima</i>
Najadales	Nodding waternymph	<i>Najas flexilis</i>
Najadales	Leafy pondweed	<i>Potamogeton foliosus</i>
Najadales	Fries' pondweed	<i>Potamogeton friesii</i>
Najadales	Whitestem pondweed	<i>Potamogeton praelongus</i>
Najadales	Small pondweed	<i>Potamogeton pusillus</i>
Najadales	Richardson's pondweed	<i>Potamogeton richardsonii</i>
Najadales	Flatstem pondweed	<i>Potamogeton zosteriformis</i>
Najadales	Sago pondweed	<i>Stuckenia pectinata</i>
Najadales	Sheathed pondweed	<i>Stuckenia vaginata</i>
Najadales	Fineleaf pondweed	<i>Stuckenia filiformis</i>
Najadales	Horned pondweed	<i>Zannichellia palustris</i>
Liliales	Rocky Mountain iris	<i>Iris missouriensis</i>
Liliales	Narrowleaf blue-eyed grass	<i>Sisyrinchium angustifolium</i>
Liliales	Tapertip onion	<i>Allium acuminatum</i>
Liliales	Shortstyle onion	<i>Allium brevistylum</i>
Liliales	Nodding onion	<i>Allium cernuum</i>
Liliales	Geyer's onion	<i>Allium geyeri</i>
Liliales	Wild chives	<i>Allium schoenoprasum</i>
Liliales	Textile onion	<i>Allium textile</i>
Liliales	White mariposa lily	<i>Calochortus eurycarpus</i>
Liliales	Sego lily	<i>Calochortus nuttallii</i>
Liliales	Small camas	<i>Camassia quamash</i>
Liliales	Bride's bonnet	<i>Clintonia uniflora</i>
Liliales	Yellow avalanche-lily	<i>Erythronium grandiflorum</i>
Liliales	Spotted fritillary	<i>Fritillaria atropurpurea</i>
Liliales	Yellow fritillary	<i>Fritillaria pudica</i>
Liliales	Common alplily	<i>Lloydia serotina</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Liliales	Feathery false lily of the valley	<i>Maianthemum racemosum</i>
Liliales	Starry false lily of the valley	<i>Maianthemum stellatum</i>
Liliales	Roughfruit fairybells	<i>Prosartes trachycarpa</i>
Liliales	Claspleaf twistedstalk	<i>Streptopus amplexifolius</i>
Liliales	Meadow deathcamas	<i>Zigadenus venenosus</i>
Orchidales	Fairy slipper	<i>Calypso bulbosa</i>
Orchidales	Summer coralroot	<i>Corallorhiza maculata</i>
Orchidales	Pacific coralroot	<i>Corallorhiza mertensiana</i>
Orchidales	Western rattlesnake plantain	<i>Goodyera oblongifolia</i>
Orchidales	Northern twayblade	<i>Listera borealis</i>
Orchidales	Slender-spire orchid	<i>Piperia unalascensis</i>
Orchidales	Northern green orchid	<i>Platanthera aquilonis</i>
Orchidales	Slender bog orchid	<i>Platanthera stricta</i>
Orchidales	Hooded lady's tresses	<i>Spiranthes romanzoffiana</i>
Typhales	Broadleaf cattail	<i>Typha latifolia</i>
Typhales	Narrowleaf bur-reed	<i>Sparganium angustifolium</i>
Typhales	Broadfruit bur-reed	<i>Sparganium eurycarpum</i>
Typhales	Floating bur-reed	<i>Sparganium fluctuans</i>
Cyperales	Water sedge	<i>Carex aquatilis</i>
Cyperales	Slenderbeak sedge	<i>Carex athrostachya</i>
Cyperales	Golden sedge	<i>Carex aurea</i>
Cyperales	Lesser paniced sedge	<i>Carex diandra</i>
Cyperales	Softleaf sedge	<i>Carex disperma</i>
Cyperales	Douglas' sedge	<i>Carex douglasii</i>
Cyperales	Needleleaf sedge	<i>Carex duriuscula</i>
Cyperales	Threadleaf sedge	<i>Carex filifolia</i>
Cyperales	Geyer's sedge	<i>Carex geyeri</i>
Cyperales	Cloud sedge	<i>Carex haydeniana</i>
Cyperales	Hood's sedge	<i>Carex hoodii</i>
Cyperales	Idaho sedge	<i>Carex idaho</i>
Cyperales	Inland sedge	<i>Carex interior</i>
Cyperales	Woollyfruit sedge	<i>Carex lasiocarpa</i>
Cyperales	Kellogg's sedge	<i>Carex lenticularis</i>
Cyperales	Smallwing sedge	<i>Carex microptera</i>
Cyperales	Manyrib sedge	<i>Carex multicostata</i>
Cyperales	Nebraska sedge	<i>Carex nebrascensis</i>
Cyperales	Chamisso sedge	<i>Carex pachystachya</i>
Cyperales	Dunhead sedge	<i>Carex phaeocephala</i>
Cyperales	Clustered field sedge	<i>Carex praegracilis</i>
Cyperales	Raynolds' sedge	<i>Carex raynoldsii</i>
Cyperales	Ross' sedge	<i>Carex rossii</i>
Cyperales	Northern singlespike sedge	<i>Carex scirpoidea</i>
Cyperales	Mountain sedge	<i>Carex scopulorum</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Cyperales	Analogue sedge	<i>Carex simulata</i>
Cyperales	Northwest Territory sedge	<i>Carex utriculata</i>
Cyperales	Valley sedge	<i>Carex vallicola</i>
Cyperales	Whitescale sedge	<i>Carex xerantica</i>
Cyperales	Needle spikerush	<i>Eleocharis acicularis</i>
Cyperales	Pale spikerush	<i>Eleocharis macrostachya</i>
Cyperales	Common spikerush	<i>Eleocharis palustris</i>
Cyperales	Fewflower spikerush	<i>Eleocharis quinqueflora</i>
Cyperales	Tall cottongrass	<i>Eriophorum angustifolium</i>
Cyperales	Simple bog sedge	<i>Kobresia simpliciuscula</i>
Cyperales	Hardstem bulrush	<i>Schoenoplectus acutus</i>
Cyperales	Indian ricegrass	<i>Achnatherum hymenoides</i>
Cyperales	Columbia needlegrass	<i>Achnatherum nelsonii</i>
Cyperales	Western needlegrass	<i>Achnatherum occidentale</i>
Cyperales	Crested wheatgrass	<i>Agropyron cristatum</i> ⁺
Cyperales	Spike bentgrass	<i>Agrostis exarata</i>
Cyperales	Redtop	<i>Agrostis gigantea</i>
Cyperales	Seashore bentgrass	<i>Agrostis pallens</i>
Cyperales	Rough bentgrass	<i>Agrostis scabra</i>
Cyperales	Shortawn foxtail	<i>Alopecurus aequalis</i>
Cyperales	Boreal alopecurus	<i>Alopecurus alpinus</i>
Cyperales	Water foxtail	<i>Alopecurus geniculatus</i>
Cyperales	American sloughgrass	<i>Beckmannia syzigachne</i>
Cyperales	Fringed brome	<i>Bromus ciliatus</i> ⁺
Cyperales	Smooth brome	<i>Bromus inermis</i> ⁺
Cyperales	Mountain brome	<i>Bromus marginatus</i>
Cyperales	Cheatgrass	<i>Bromus tectorum</i> ⁺
Cyperales	Bluejoint	<i>Calamagrostis canadensis</i>
Cyperales	Plains reedgrass	<i>Calamagrostis montanensis</i>
Cyperales	Pinegrass	<i>Calamagrostis rubescens</i>
Cyperales	Northern reedgrass	<i>Calamagrostis stricta</i>
Cyperales	Water whorlgrass	<i>Catabrosa aquatica</i>
Cyperales	Drooping woodreed	<i>Cinna latifolia</i>
Cyperales	Orchardgrass	<i>Dactylis glomerata</i>
Cyperales	Timber oatgrass	<i>Danthonia intermedia</i>
Cyperales	Tufted hairgrass	<i>Deschampsia caespitosa</i>
Cyperales	Slender hairgrass	<i>Deschampsia elongata</i>
Cyperales	Saltgrass	<i>Distichlis spicata</i>
Cyperales	Baker's wheatgrass	<i>Elymus bakeri</i>
Cyperales	Blue wildrye	<i>Elymus glaucus</i>
Cyperales	Thickspike wheatgrass	<i>Elymus lanceolatus</i>
Cyperales	Quackgrass	<i>Elymus repens</i>
Cyperales	Slender wheatgrass	<i>Elymus trachycaulus</i>

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Cyperales	Alpine fescue	<i>Festuca brachyphylla</i>
Cyperales	Idaho fescue	<i>Festuca idahoensis</i>
Cyperales	Western fescue	<i>Festuca occidentalis</i>
Cyperales	Small floating mannagrass	<i>Glyceria borealis</i>
Cyperales	American mannagrass	<i>Glyceria grandis</i>
Cyperales	Fowl mannagrass	<i>Glyceria striata</i>
Cyperales	Needle-and-thread	<i>Hesperostipa comata</i>
Cyperales	Meadow barley	<i>Hordeum brachyantherum</i>
Cyperales	Foxtail barley	<i>Hordeum jubatum</i>
Cyperales	Prairie Junegrass	<i>Koeleria macrantha</i>
Cyperales	Basin wildrye	<i>Leymus cinereus</i>
Cyperales	Yellow wildrye	<i>Leymus flavescens</i>
Cyperales	Purple oniongrass	<i>Melica spectabilis</i>
Cyperales	Marsh muhly	<i>Muhlenbergia racemosa</i>
Cyperales	Mat muhly	<i>Muhlenbergia richardsonis</i>
Cyperales	Western wheatgrass	<i>Pascopyrum smithii</i>
Cyperales	Alpine timothy	<i>Phleum alpinum</i>
Cyperales	Common timothy	<i>Phleum pratense</i>
Cyperales	Canada bluegrass	<i>Poa compressa</i>
Cyperales	Cusick's bluegrass	<i>Poa cusickii</i>
Cyperales	Fowl bluegrass	<i>Poa palustris</i>
Cyperales	Kentucky bluegrass	<i>Poa pratensis</i>
Cyperales	Sandberg's bluegrass	<i>Poa secunda</i>
Cyperales	Rough bluegrass	<i>Poa trivialis</i>
Cyperales	Bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>
Cyperales	Nuttall's alkaligrass	<i>Puccinellia nuttalliana</i>
Cyperales	Alkali cordgrass	<i>Spartina gracilis</i>
Cyperales	Spike trisetum	<i>Trisetum spicatum</i>
Juncales	Baltic rush	<i>Juncus arcticus</i> ssp. <i>littoralis</i>
Juncales	Toad rush	<i>Juncus bufonius</i>
Juncales	Colorado rush	<i>Juncus confusus</i>
Juncales	Drummond's rush	<i>Juncus drummondii</i>
Juncales	Common rush	<i>Juncus effusus</i>
Juncales	Swordleaf rush	<i>Juncus ensifolius</i>
Juncales	Hall's rush	<i>Juncus hallii</i>
Juncales	Longstyle rush	<i>Juncus longistylis</i>
Juncales	Parry's rush	<i>Juncus parryi</i>
Juncales	Rocky Mountain rush	<i>Juncus saximontanus</i>
Juncales	Smallflowered woodrush	<i>Luzula parviflora</i>
Hydrocharitales	Canadian waterweed	<i>Elodea canadensis</i>
Arales	Star duckweed	<i>Lemna trisulca</i>
Arales	Common duckweed	<i>Lemna minor</i>

CLASS FILICOPSIDA

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Polypodiales	Brittle bladderfern	<i>Cystopteris fragilis</i>
Polypodiales	Oregon cliff fern	<i>Woodsia oregana</i>
Polypodiales	Brewer's cliffbrake	<i>Pellaea breweri</i>

CLASS EQUISETOPSIDA

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Equisetales	Field horsetail	<i>Equisetum arvense</i>
Equisetales	Smooth horsetail	<i>Equisetum laevigatum</i>
Equisetales	Water horsetail	<i>Equisetum fluviatile</i>
Equisetales	Marsh horsetail	<i>Equisetum palustre</i>

CLASS LYCOPODIOPSIDA

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Isoetales	Quillwort	<i>Isoetes</i> spp.

CLASS CHAROPHYCEAE

<i>Order</i>	<i>Common Name</i>	<i>Scientific Name</i>
Charales	Common stonewort	<i>Chara vulgaris</i>

* *rare species*+ *nonnative species*

Appendix H

Fire Management Program

The U.S. Fish and Wildlife Service has administrative responsibility which includes fire management for Red Rock Lakes National Wildlife Refuge, which covers approximately 48,955 acres in southwestern Montana.

THE ROLE OF FIRE

Vegetation in the Rocky Mountains evolved under periodic disturbance and defoliation from fire, drought, floods, large herbivores, insect outbreaks, and disease. These periodic disturbances are what kept the ecosystem diverse and healthy, while maintaining significant biodiversity for thousands of years.

Historically, naturally occurring wildland fire played an important disturbance role in many ecosystems by stimulating regeneration, cycling nutrients, providing a diversity of habitats for plants and wildlife, and decreasing the impacts of insects and diseases.

When fire is excluded on a broad scale, the accumulation of living and dead fuels can contribute to degraded plant communities and wildlife habitats. These fuel accumulations often change fire system characteristics, and have created potential for uncharacteristically severe wildland fires.

Return of fire in most ecosystems is essential for healthy vegetation for wildlife habitat in grasslands, wetlands, and forests. When integrated back into an ecosystem, fire can help restore and maintain healthy systems and reduce the risk of wildland fires. To make fire's natural role in the environment easier, fire first must be integrated into land and resource management plans and activities on a broad scale.

Fire, when properly utilized, can

- reduce hazardous fuels buildup in both wildland–urban interface (WUI) and non-WUI areas;
- improve wildlife habitats by reducing the density of vegetation or changing plant species composition;
- sustain or increase biological diversity;
- improve woodlands and shrublands by reducing plant density;

- reduce susceptibility of plants to insect and disease outbreaks;
- improve the effectiveness of an integrated pest management program (such as for controlling smooth brome).

WILDLAND FIRE MANAGEMENT POLICY AND GUIDANCE

An update of the 1995 “Federal Fire Policy” was completed and approved in 2001 by the Secretaries of the Interior and Agriculture. The 2001 “Federal Wildland Fire Management Policy” directs federal agencies to achieve a balance between fire suppression to protect life, property, and resources, and fire use to regulate fuels and maintain healthy ecosystems. In addition, it directs agencies to use the appropriate management response for all wildland fire regardless of the ignition source. This policy provides eight guiding principles that are fundamental to the success of the fire management program:

- Firefighter and public safety is the first priority in every fire management activity.
- The role of wildland fires as an ecological process and natural change agent will be incorporated into the planning process.
- Fire management plans, programs, and activities support land and resource management plans and their implementation.
- Sound risk management is a foundation for all fire management activities.
- Fire management programs and activities are economically viable, based on values to be protected, costs, and land and resource management objectives.
- Fire management plans (FMPs) and activities are based on the best available science.
- FMPs and activities incorporate public health and environmental quality consideration.
- Federal, state, tribal, local, interagency, and international coordination and cooperation are essential.
- Standardization of policies and procedures among federal agencies is an ongoing objective.

The fire management considerations, guidance, and direction should be addressed in the land

use resource plans such as the comprehensive conservation plan (CCP). FMPs are step-down processes from the land use plans and habitat plans, with more detail on fire suppression, fire use, and fire management activities.

MANAGEMENT DIRECTION

Red Rock Lakes National Wildlife Refuge will suppress human-caused fires and wildfires that threaten life and property. The use of appropriate management response will be incorporated into the refuge's FMP to allow agency administrators the ability to choose from a full spectrum of fire suppression actions. Appropriate suppression actions, whether aggressive, high intensity, or low intensity actions, will be based on preplanned analysis and executed to minimize suppression costs, and resource losses consistent with land management objectives.

Wildland fire and prescribed fire, as well as manual and mechanical fuel treatments will be used in an ecosystem context to protect both federal and private property, and for habitat management purposes. Fuel reduction activities will be applied in collaboration with federal, state, private, and nongovernmental organization partners. In addition, fuel treatments will be prioritized based on the guidance for prioritization established in the goals and strategies outlined in the "U.S. Fish and Wildlife Services National Wildlife Refuge System Wildland Fire Management Program Strategic Plan 2003–2010" and "Region 6 Refuges Regional Priorities FY07 to FY11." For WUI treatments, areas with community wildfire protection plans (CWPPs) and "Communities at Risk" will be the primary focus. The settlement of Lakeview, Montana, located adjacent to the refuge, was identified as a "Community at Risk" in the *Federal Register*: August 17, 2001 (Volume 66, Number 160). Lakeview is being incorporated into a CWPP.

All aspects of the fire management program will be conducted in a manner consistent with applicable laws, policies, and regulations. Red Rock Lakes National Wildlife Refuge will maintain an FMP to accomplish the fire management goals described below. Wildland fire, prescribed fire, and manual and mechanical fuel treatments will be applied in a scientific manner under selected weather and environmental conditions.

FIRE MANAGEMENT GOALS

The goals and strategies of the U.S. Fish and Wildlife Service National Wildlife Refuge System Wildland Fire Management Program Strategic Plan are consistent with the U.S. Department of the Interior and Service policies, National Fire Plan direction, the President's Healthy Forest Initiative, the 10-Year Comprehensive Strategy and Implementation Plan,

National Wildfire Coordinating Group Guidelines, initiatives of the Wildland Fire Leadership Council, and Interagency Standards for Fire and Aviation Operations.

The "Region 6 Refuges Regional Priorities FY07 through FY11" are consistent with the refuge's vision statement for region 6: "to maintain and improve the biological integrity of the region, ensure the ecological condition of the region's public and private lands are better understood, and endorse sustainable use of habitats that support native wildlife and people's livelihoods."

REFUGE FIRE MANAGEMENT GOALS

The goal of the refuge's fire management program is to work with our interagency partners to:

1. suppress human-caused fires and wildfires that threaten life and property.
2. reduce wildland fire risk to the community of Lakeview and other structures on public and private land through hazardous fuels reduction treatments.
3. use wildland and prescribed fire, manual, and mechanical treatment methods to achieve habitat goals and objectives identified in this CCP using scientific techniques and adaptive resource management to monitor results.
4. update the current (2002) "Fire Management Plan," incorporating fire management within an interagency fire management plan.

STRATEGIES

Strategies and tactics that consider public and firefighter safety as well as resource values at risk will be used. Wildland fire use and suppression, prescribed fire methods, manual and mechanical methods, timing, and monitoring are described in more detail within step-down FMPs.

All management actions will use wildland fire, prescribed fire, and manual or mechanical treatment methods to reduce hazardous fuels, restore and maintain desired habitat conditions, and control nonnative vegetation within the diverse ecosystem habitats. The fuels treatment program will be outlined in the FMP for the refuges. Site-specific prescribed fire plans will be developed following the "Interagency Prescribed Fire Planning and Implementation Procedures Reference Guide" (2006) template.

Prescribed fire temporarily reduces air quality by reducing visibility and releasing components through combustion. The refuge will meet the Clean Air Act emission standards by adhering to the "Montana State Implementation Plan" requirements during all prescribed fire activities.

FIRE MANAGEMENT ORGANIZATION, CONTACTS, AND COOPERATION

Qualified fire management technical oversight for the refuge will be established by region 6, using the fire management district approach. Under this approach, fire management staff will be determined by established modeling systems based on the fire management workload of a group of refuges, and possibly that of interagency partners. The fire management workload consists of historical wildland fire activity, as well as historical and planned fuels treatments.

Depending on budgets, fire management staffing and support equipment may be located at the administrative station or at other refuges within the district and shared between all units. Fire management activities will be conducted in a coordinated and collaborative manner with federal and nonfederal partners.

A new FMP for Red Rock Lakes National Wildlife Refuge will be developed in collaboration with interagency partners.

Bibliography

- [Anon.] 2007. Check-list of North American birds. [Place of publication unknown]: American Ornithologists' Union. 7th ed., 48th supplement, 829 p.
- [Anon.] [No date]. Miscellaneous publication no. 54. Missoula, MT: Montana Forest and Conservation Experiment Station, School of Forestry, University of Montana. [Pages unknown].
- Aitken, K.E.H.; Wiebe, K.L.; Martin, K. 2002. Nest-site reuse patterns for a cavity-nesting bird community in interior British Columbia. *The Auk* 119:391–402.
- Albanese J.A.; Hill C.L.; Davis L.B. 1995. Upper Pleistocene geology of the Merrell site (24BE1659), Centennial Valley, Southwest Montana. *Current research in the Pleistocene* 12:117–119.
- Allen, W. 1952. Letter discussing the conservation of grayling within the grayling sanctuary. Letter addressed to Kenneth MacDonald, Wildlife Refuge Supervisor, 11 June 1952. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- Allen-Diaz, B.H. 1991. Water table and plant species relationships in Sierra Nevada meadows. *American Midland Naturalist* 126:30–43.
- Alisauskas, R.T.; Ankney, C.D. 1992. The cost of egg laying and its relationship to nutrient reserves in waterfowl. In: Batt, B.D.J.; Afton, A.D.; Anderson, M.G.; Ankney, C.D.; Johnson, D.H.; Kadlec, J.A.; Krapu, G.L., editors. *Ecology and management of breeding waterfowl*. Minneapolis: University of Minnesota Press. 30–61.
- Altman, B.; Sallabanks, R. 2000. Olive-sided flycatcher (*Contopus cooperi*). In: Poole, A.; Gill, F., editors. *The birds of North America* 502. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. *Birds of North America Online*. <<http://bna.birds.cornell.edu/bna/species/502>> accessed May 2009.
- Ammon, E.M. 1995. Lincoln's sparrow (*Melospiza lincolni*). In: Poole, A.; Gill, F., editors. *The birds of North America* 191. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. *Birds of North America Online*. <<http://bna.birds.cornell.edu/bna/species/191>> accessed February 2008.
- Anderson, S.H. 1995. Recreational disturbance and wildlife populations. In: Knight, R.L.; Gutzwiller, K.J., editors. *Wildlife and Recreationists: coexistence through management and research*. Washington DC: Island Press, 157–168.
- Anderson, M.; Bourgeron, P.; Bryer, M.T.; Crawford, R.; Engelking, L.; Faber-Langendoen, D.; Gallyoun, M.; Goodin, K.; Grossman, D.H.; Landaal, S.; Metzler, K.; Patterson, K.D.; Pyne, M.; Reid, M.; Sneddon, L.; Weakley, A.S. 1998. International classification of ecological communities: terrestrial vegetation of the United States. Volume 2. In: *The national vegetation classification system: list of types*. Arlington, VA: The Nature Conservancy. 126 p.
- Anderson, M.G.; Low, J.B. 1976. Use of sago pondweed by waterfowl on the Delta Marsh, Manitoba. *Journal of Wildlife Management* 40:233–242.
- Arcese, P.; Sogge, M.K.; Marr, A.B.; Patten, M.A. 2002. Song sparrow (*Melospiza melodia*). In: Poole, A.; Gill, F., editors. *The birds of North America* 704. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. *Birds of North America Online*. <<http://bna.birds.cornell.edu/bna/species/704>> accessed May 2007.
- Austin, J.E.; Miller, M.R. 1995. Northern pintail (*Anas acuta*). In: Poole, A.; Gill, F., editors. *The birds of North America* 163. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. *Birds of North America Online*. <<http://bna.birds.cornell.edu/bna/species/163>> accessed December 2007.
- Austin, J.E.; Henry, A.R.; Ball, I.J. 2007. Sandhill crane abundance and nesting ecology at Grays Lake, Idaho. *Journal of Wildlife Management* 71:1067–1079.
- Baker, W.L. 2006. Fire and restoration of sagebrush ecosystems. *Wildlife Society Bulletin* 34:177–185.
- Baldassarre, G.A.; Bolen, E.G. 2006. *Waterfowl ecology and management*. 2nd ed. Melbourne, FL: Krieger Publishing Company. 567 p.
- Banko, W.E. 1960. The trumpeter swan: its history, habits, and population in the United States. *North American Fauna* 63. Washington DC: Bureau of Sport Fisheries and Wildlife. 214 p.

- Bartelt, G.A. 1987. Effects of disturbance and hunting on the behavior of Canada goose family groups in east central Wisconsin. *Journal of Wildlife Management* 51:517–522.
- Bartos, D.L.; Campbell, R.B. 1998. Decline of quaking aspen in the Interior West—examples from Utah. *Rangelands* 20:17–24.
- Bauer, H.G.; Stark, H.; Frenzel, P. 1992. Disturbance factors and their effects on water birds wintering in the western parts of Lake Constance. *Der Ornithologische Beobachter* 89:81–91.
- Bayley, S.E.; Prather, C.M. 2003. Do wetland lakes exhibit alternative stable states? Submersed aquatic vegetation and chlorophyll in western boreal shallow lakes. *Limnology and Oceanography* 48:2335–2345.
- BBC Consulting. 2007. Red Rock Lakes National Wildlife Refuge socioeconomic impact analysis. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT. 1-11.
- Beaverhead County History Book Association. 1990. The history of Beaverhead County [1800–1920]. Volume 1. Dillon, MT: [Publisher unknown]. 696 p.
- Beed, W.E. 1957. Red Rock Lakes Aquatic Survey 1955 and 1956. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- Bennett, K.A.; Zuelke, E. 1999. The effects of recreation on birds: a literature review. Smyrna, DE: Delaware Natural Heritage Program. [Pages unknown].
- Berger, J.; Stacey, P.B.; Bellis, L.; Johnson, M.P. 2001. A mammalian predator-prey imbalance: grizzly bear and wolf extinction affect avian Neotropical migrants. *Ecological Applications* 11:947–960.
- Beschta, R.L. 2003. Cottonwoods, elk, and wolves in the Lamar Valley of Yellowstone National Park. *Ecological Applications* 13:1295–1309.
- Bishop, R.A.; Andrews, R.D.; Bridges, R.J. 1979. Marsh management and its relationship to vegetation, waterfowl, and muskrats: Proceedings; 1979; Iowa. In: Proceedings of the Iowa Academy of Science 86:50–56.
- Brinson, M.M.; Lugo, A.E.; Brown, S. 1981. Primary productivity, decomposition and consumer activity in freshwater wetlands. *Annual Review of Ecological Systems* 12:123–161.
- Brown, K.; Hansen, A.J.; Keane, R.E.; Graumlich, L.J. 2006. Complex interactions shaping aspen dynamics in the Greater Yellowstone Ecosystem. *Landscape Ecology* 21:933–951.
- Bunting, S.C.; Robberecht, R.; Defosse, G.E. 1998. Length and timing of grazing on postburn productivity of two bunchgrasses in an Idaho experimental range. *International Journal of Wildland Fire* 8:15–20.
- Bunting, S.C.; Kilgore, B.M.; Bushey, C.L. 1987. Guidelines for prescribed burning sagebrush-grass rangelands in the northern Great Basin. USDA Forest Service General Technical Report INT-231. Ogden, UT: U.S. Department of Agriculture. 33 p.
- Burger, J.; Gochfeld, M.; 1994. Franklin's gull (*Larus pipixcan*). In: Poole, A.; Gill, F., editors. The birds of North America 116. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. Birds of North America Online. <<http://bna.birds.cornell.edu/bna/species/116>> accessed August 2007.
- Burke, J.M.; Prepas, E.E.; Pinder, S. 2005. Runoff and phosphorus export patterns in large forested watersheds on the western Canadian Boreal Plain before and for 4 years after wildfire. *Journal of Environmental Engineering and Science* 4:319–325.
- Cary, K.L. 2005. Willow resilience on Yellowstone's northern elk winter range: a function of environmental gradients. [master's thesis]. Bozeman, MT: Montana State University. 155 p.
- Casey, D. 2000. Partners in flight draft bird conservation plan Montana. Version 1.0. Kalispell, MT: American Bird Conservancy, Montana Partners in Flight. 288 p.
- Castelli, R.M.; Chambers, J.C.; Tausch, R.J. 2000. Soil-plant relations along a soil-water gradient in Great Basin riparian meadows. *Wetlands* 20:251–266.
- Chadwick, H.W.; Dalke, P.D. 1965. Plant succession on sand dunes in Fremont County, Idaho. *Ecology* 46:765–780.
- Chilton, G.; Baker, M.C.; Barrentine, C.D.; Cunningham, M.A. 1995. White-crowned sparrow (*Zonotrichia leucophrys*). In: Poole, A.; Gill, F., editors. The birds of North America 183. Ithaca NY: Cornell Laboratory of Ornithology. [Internet]. Birds of North America Online. <<http://bna.birds.cornell.edu/bna/species/183>> accessed August 2007.
- Christiansen, R.L. 2001. The Quaternary and Pliocene Yellowstone Plateau volcanic field of Wyoming, Idaho, and Montana. U.S. Geological Professional Paper 729-G. [Place of publication unknown]: U. S. Geological Survey. 145 p.
- Cole, D.N.; Knight, R.L. 1990. Impacts of recreation on biodiversity in wilderness. In: Wilderness areas: their impacts; proceedings of a symposium, [Date of workshop symposium unknown]; [Place of symposium unknown]. Logan, UT: Utah State University. 33–40.

- Colwell, M.A.; Jehl, J.R. 1994. Wilson's phalarope (*Phalaropus tricolor*). In: Poole, A.; Gill, F., editors. The birds of North America 183. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. Birds of North America Online. <<http://bna.birds.cornell.edu/bna/species/083>> accessed May 2008.
- Connelly, J.W.; Schroeder, M.A.; Sands, A.R.; Braun, C.E. 2000. Guidelines to manage sage grouse populations and their habitats. Wildlife Society Bulletin 28:967–985.
- Cooper, D.J.; Dickens, J.; Thompson Hobbs, N.; Christensen, L.; Landrum, L. 2006. Hydrologic, geomorphic, and climatic processes controlling willow establishment in a montane ecosystem. Hydrological Processes 20:1845–864.
- Cooper, S.V. 1999. Plant associations of the Red Rock Lakes National Wildlife Refuge: abbreviated community descriptions to accompany vegetation map. Report to the U.S. Fish and Wildlife Service. On file at Montana Natural Heritage Program. Helena, MT.
- Cooper, S.V.; Jean, C.; Heidel, B.L. 1999. Plant associations and related botanical inventory of the Beaverhead Mountains Section, Montana. Report to the Bureau of Land Management. On file at Montana Natural Heritage Program. Helena, MT.
- Cronan, J.M. 1957. Food and feeding habits of the scaups in Connecticut waters. The Auk 74(4):459–468.
- Cullen, S.A.; Jehl Jr., J.R.; Nuechterlein, G.L. 1999. Eared grebe (*Podiceps nigricollis*). In: Poole, A.; Gill, F., editors. The birds of North America 433. Philadelphia: The Birds of North America, Inc. [Pages unknown].
- Dai, X.; Boutton, T.W.; Hailemichael, M.; Ansley, R.J.; Jeffup, K.E. 2006. Soil carbon and nitrogen storage in response to fire in a temperate mixed-grass savanna. Journal of Environmental Quality 35:1620–1628.
- Dechant, J.A.; Sondreal, M.L.; Johnson, D.H.; Igl, L.D.; Goldade, C.M.; Nenneman, M.P.; Euliss, B.R. 2003. Effects of management practices on grassland birds: short-eared owl. [Internet]. Revised December 12, 2003. Northern Prairie Wildlife Research Center Online. <<http://www.npwrc.usgs.gov/resource/literatr/grasbird/seow/seow.htm>> accessed June 2007.
- DeLong, A. 2002. Managing visitor use & disturbance of waterbirds: a literature review of impacts and mitigation measures. Appendix L. In: Stillwater National Wildlife Refuge Complex final environmental impact statement for the comprehensive conservation plan and boundary revision. Vol. 2. Portland OR: U.S. Department of the Interior, U.S. Fish and Wildlife Service, region 1. 114 p.
- Dobb, E. 1998. Reality check: the debate behind the lens. Audubon 1:44–51, 98–99.
- Dobkin, D.S.; Rich, A.C.; Pretare, J.A.; Pyle, W.H. 1995. Nest-site relationships among cavity-nesting birds of riparian and snowpocket aspen woodlands in the northwestern Great Basin. Condor 97:694–707.
- Dorn, R. D. 1969. Relations of moose, cattle, and willows in southwestern Montana. [master's thesis]. Bozeman, MT: Montana State University. 79 p.
- Dorn, R.D. 1970. Moose and cattle food habits in southwest Montana. Journal of Wildlife Management 34:559–564.
- Douglas, D.C.; Ratti, J.T.; Black, R.A.; Alldredge, J.R. 1992. Avian habitat associations in riparian zones of Idaho's Centennial Mountains. Wilson Bulletin 104:485–500.
- Dugger, B.D.; Dugger, K.M. 2002. Long-billed curlew (*Numenius americanus*). In: Poole, A.; Gill, F., editors. The birds of North America 628. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. Birds of North America Online. <<http://bna.birds.cornell.edu/bna/species/628>> accessed May 2008.
- Dwire, K.A.; Kauffman, J.B. 2003. Fire and riparian ecosystems in landscapes of the western USA. Forest Ecology and Management 178:61–74.
- Dwire, K.A.; Kauffman, J.B.; Baham, J.E. 2006. Plant species distribution in relation to water-table depth and soil redox potential in montane riparian meadows. Wetlands 26:131–146.
- Egertson, C.J.; Kopaska, J.A.; Downing, J.A. 2004. A century of change in macrophyte abundance and composition in response to agricultural eutrophication. Hydrobiologia 624:145–156.
- Errington, P.L. 1961. Muskrats and marsh management. Lincoln, NE: University of Nebraska Press. 183 p.
- Esser, L.L. 1992. *Achnatherum richardsonii*. In: Fire effects information system. [Internet]. Revised June 29, 2007. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. <<http://www.fs.fed.us/database/feis/>> accessed April 2007.
- Ferguson, S.H.; Bisset, A.R.; Messier, F. 2000. The influences of density on growth and reproduction in moose *Alces alces*. Wildlife Biology 6:31–39.
- Ferrel M.H.; Hauck, C.W.; Myer, R.C. 1981. Colorado Rail annual No. 15: Idaho–Montana issue. [Place of

- publication unknown]: Colorado Railroad museum. 216 p.
- Finch, D.M. 1989. Habitat use and habitat overlap of riparian birds in three elevational zones. *Ecology* 70:866–880.
- Finch, D.M.; Reynolds, R.T. 1987. Bird response to understory variation and conifer succession in aspen forests. In: Emmerick, J. et al., editors. Proceedings of issues and technology in management of impacted wildlife: Proceedings, [Title of proceedings unknown]; [Date of proceedings unknown]; [Place of proceedings unknown]. Colorado Springs, CO: Thorne Ecological Institute. 87–96.
- Fondell, T.F.; Ball, I.J. 2004. Density and success of bird nests relative to grazing on western Montana grasslands. *Biological Conservation* 117:203–213.
- Foresman, K.R. 2001. The wild mammals of Montana. Special Publication No. 12. Lawrence, KS: The American Society of Mammalogists. 278 p.
- Fox, A.D.; Madsen, J. 1997. Behavioral and distributional effects of hunting disturbance on waterbirds in Europe: implications for refuge design. *Journal of Applied Ecology* 34:1–13.
- Fredrickson, L.H.; Heitmeyer, M.E. 1991. Life history strategies and habitat needs of the northern pintail. In: Waterfowl Management Handbook. Washington DC: U.S. Fish and Wildlife Service. 8 p.
- Fuguitt, G.V. 1985. The nonmetropolitan population turnaround. *Annual Review of Sociology* 11:259–280.
- Gaillard, J.M.; Festa-Bianchet, M.; Yoccoz, N.G.; Loison, A.; Toïgo, C. 2000. Temporal variation in fitness components of large herbivores. *Annual Review of Ecology and Systematics* 31:367–393.
- Gallant, A.L.; Hansen, A.J.; Councilman, J.S.; Monte, D.K.; Betz, D.W. 2003. Vegetation dynamics under fire exclusion and logging in a Rocky Mountain Watershed, 1856–1996. *Ecological Applications* 13:385–403.
- Gangloff, M.M. 1996. Winter habitat and distribution of Arctic grayling in Upper Red Rock Lake, Red Rock Lakes National Wildlife Refuge, Montana. [master's thesis]. Bozeman, MT: Montana State University. 101 p.
- Gardali, T.; Ballard, G. 2000. Warbling vireo (*Vireo gilvus*). In: Poole, A.; Gill, F., editors. The birds of North America 551. Ithaca NY: Cornell Laboratory of Ornithology. [Internet]. Birds of North America Online. <<http://bna.birds.cornell.edu/bna/species/551>> accessed May 2008.
- Geist, V.; Mahoney, S.P.; Organ, J.F. 2001. Why hunting has defined the North American Model of Wildlife Conservation. In: Transactions of the North American Wildlife and Natural Resources Conference: North American Wildlife and Natural Resources Conference, 2001, March 20; Washington, DC: [Name of publisher unknown]. 66:175–185.
- Geist, V.; Organ, J.F. 2004. The public trust foundation of the North American Model of Wildlife Conservation. *Northeast Wildlife* 58:49–56.
- Giles, L.; Holt, M.; Montgomery, C.; Rule, D., editors. 2006. Centennial Valley: a journey through time 1820–1930. Volume 1. Centennial Valley Historical Society. Butte, MT: Arcraft Printers. 30 p.
- Greater Yellowstone Coalition. 2006. The Greater Yellowstone Ecosystem. [Internet]. <<http://www.greateryellowstone.org/ecosystem/>> accessed 1 February 2009.
- Grinnell, G.B. 1913. Brief history of the Boone and Crockett Club. In: Grinnell, G.B., editor. *Hunting at high altitudes*. New York: Harper & Brothers. 422–491.
- Guzy, M.J.; Ritchison, G. 1999. Common yellowthroat (*Geothlypis trichas*). In: Poole, A.; Gill, F., editors. The birds of North America 448. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. Birds of North America Online. <<http://bna.birds.cornell.edu/bna/species/448>> accessed May 2008.
- Hansen, A.J.; Rotella, J.J.; Kraska, M.P.V.; Brown, D. 2000. Spatial patterns of primary productivity in the Greater Yellowstone Ecosystem. *Landscape Ecology* 15:505–522.
- Hansen, P.L.; Pfister, R.D.; Boggs, K.; Cook, B.J.; Joy, J.; Hinckley, D.K. 1995. Classification and management of Montana's riparian and wetland sites. Miscellaneous Publication No. 54. Missoula, MT: University of Montana, School of Forestry, Montana Forest and Conservation Station. 646 p.
- Harris, S.W.; Marshall, W.H. 1963. Ecology of water-level manipulations on a northern marsh. *Ecology* 44:331–343.
- Hart, J.H.; Hart, D.L. 2001. Heartrot fungi's role in creating picid nesting sites in living aspen. In: Shepperd, W.D.; Binkley, D.; Bartos, D.L.; Stohlgren, T.J.; Eskew, L.G., compilers. Sustaining aspen in western landscapes: symposium proceedings. [Place of publication unknown]: USDA Forest Service Proceedings RMRS-P-18. 207–213.
- Harting A.; Glick D. 1994. Sustaining Greater Yellowstone, a blueprint for the future. Bozeman, MT: Greater Yellowstone Coalition. 63 p.

- Hauer, F.R.; Spencer, C.N. 1998. Phosphorous and nitrogen dynamics in streams associated with wildfire: a study of immediate and longterm effects. *International Journal of Wildland Fire* 8:183–198.
- Havera, S.P.; Boens, L.R.; Georgi, M.M.; Shealy, R.T. 1992. Human disturbance of waterfowl on Keokuk Pool, Mississippi River. *Wildlife Society Bulletin* 20:290–298.
- Heitmeyer, M.E.; Raveling, D.G. 1988. Winter resource use by three species of dabbling ducks in California. Report to the Department of Wildlife and Fisheries Biology, University of California, Davis, California. On file at Delta Waterfowl and Wetlands Research Center, Portage La Prairie, Manitoba, Canada.
- Hendricks, P.; Roedel, M. 2001. A faunal survey of the Centennial Valley Sandhills, Beaverhead County, Montana. Report to the U.S. Bureau of Land Management and U.S. Fish and Wildlife Service. Helena, MT: Montana Natural Heritage Program. 44 p.
- Herkert, J.R.; Simpson, S.A.; Westemeier, R.L.; Esker, T.L.; Walk, J.W. 1999. Response of northern harriers and short-eared owls to grassland management in Illinois. *Journal of Wildlife Management* 63:517–523.
- Heyerdahl, E.K.; Miller, R.F.; Parsons, R.A. 2006. History of fire and Douglas-fir establishment in a savanna and sagebrush–grassland mosaic, southwestern Montana, USA. *Forest Ecology and Management* 230:107–118.
- Hinds, T.E. 1985. Diseases. In DeByle, N.V.; Winokur, R.P., editors. *Aspen: ecology and management in the western United States*. USDA Forest Service General Technical Report RM-119. Fort Collins, CO: Rocky Mountain Forest and Range Experiment Station. 87–106.
- Holling, C.S. 1978. *Adaptive environmental assessment and management*. London: John Wiley and Sons. 377 p.
- Houston, D. B. 1968. The Shiras moose in Jackson Hole, Wyoming. Technical Bulletin 1. [Place of publication unknown]: Grand Teton Natural History Association. 110 p.
- Howard, Janet L. 1996. *Bromus inermis*. In: Fire Effects Information System. [Internet]. Revised 6 July 2007. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. <<http://www.fs.fed.us/database/feis/>> [Access date unknown].
- Intermountain West Joint Venture 2005a. Coordinated implementation plan for bird conservation in western Montana. [Place of publication unknown]: Montana Steering Committee Intermountain West Joint Venture. 58 p.
- Intermountain West Joint Venture 2005b. Intermountain West Joint Venture coordinated bird conservation plan. [Place of publication unknown]: Intermountain West Joint Venture. 94 p.
- Jeppesen, E.; Søndergaard, M.; Christoffersen, K. 1998. *The structuring role of submerged macrophytes in lakes*. New York: Springer-Verlag. 423 p.
- Johnson, D.; Igl, L.D. 2001. Area requirements of grassland birds: a regional perspective. *The Auk* 118:24–34.
- Jones, J.R.; DeByle, N.V. 1985. Morphology. In: DeByle, N.V.; Winokur, R.P., editors. *Aspen: ecology and management in the western United States*. General Technical Report RM-GTR-119. Fort Collins, CO: U.S. Department of Agriculture, Forest Service. 11–18.
- Kadlec, J.A. 1962. Effects of a drawdown on a waterfowl impoundment. *Ecology* 43:267–281.
- Kadlec, J.A.; Smith, L.M. 1989. The great basin marshes. In: Smith, L.M.; Pederson, R.L.; Kaminski, R.M., editors. *Habitat management for migrating and wintering waterfowl in North America*. Lubbock, TX: Texas Tech University Press. 560 p.
- Kaeding, L.R.; Boltz, G.D. 1999. A study of Arctic grayling and their stream habitat in support of reserved water right applications, Red Rock Lakes National Wildlife Refuge, Montana. On file at U.S. Fish and Wildlife Service, Bozeman, MT.
- .2004. Use of remote-site incubators to produce Arctic grayling fry of wild parentage. *North American Journal of Fisheries Management* 24:1031–1037.
- Kaminski, R.M.; Prince, H.H. 1981. Dabbling duck and aquatic macroinvertebrate responses to manipulated wetland habitat. *Journal of Wildlife Management* 45:1–15.
- Kantrud, H.A. 1990. Sago pondweed (*Potamogeton pectinatus* L.): a literature review. Resource Publication 176. Washington DC: U.S. Fish and Wildlife Service. 89 p.
- Kantrud, H.A.; Higgins, K.F. 1992. Nest and nest site characteristics of some ground-nesting, non-passerine birds of northern grasslands. *Prairie Naturalist* 24:67–84.
- Kaya, C.M. 1992. Review of the decline and status of fluvial Arctic grayling, *Thymallus arcticus*,

- in Montana. In: Proceedings of the Montana Academy of Sciences 1992; [Date of proceedings unknown]; [Place of proceedings unknown]. [Place of publication unknown]: [Publisher unknown]. 52:43–70.
- Keigley, R.B.; Frisina, M.R. 2001. Browse conditions at Red Rock Lakes National Wildlife Refuge. In: Knapp, S.J.; Frisina, M.R., editors. Statewide browse evaluation. Project Report No. 1. Helena, MT: Montana Fish, Wildlife and Parks, Wildlife Division, Habitat Bureau. 74 p.
- Keigley, R.B.; Frisina, M.R.; Fager, C. 2002. Assessing browse trend at the landscape level; part 2: monitoring. *Rangelands* 24:34–38.
- Kendall, W.L. 2001. Using models to facilitate complex decisions. In: Shenk, T.M.; Franklin, A.B., editors. Modeling in natural resource management: development, interpretation, and application. Washington DC: Island Press. 223 p.
- Kercheval, B. 1935. Detailed plans, Red Rock Lakes Migratory Bird Refuge, project of the Bureau of Biological Survey, February 19, 1935. Washington DC: Bureau of Biological Survey. 6 p.
- Klein, M.L. 1993. Waterbird behavioral responses to human disturbances. *Wildlife Society Bulletin* 21:31–39.
- Knick, S.T.; Rotenberry, J.T. 1995. Landscape characteristics of shrubsteppe habitats and breeding passerine birds. *Conservation Biology* 9:1059–1071.
- Knight, R.L.; Cole, D.N. 1995. Wildlife responses to recreationists. In: Knight, R.L.; Gutzwiller, K.J., editors. *Wildlife and recreationists*. Covelo, CA: Island Press. 372 p.
- Korb, N.T. 2005. Historical fire regimes and structures of Douglas-fir forests in the Centennial Valley of southwest Montana. [master's thesis]. Fort Collins, CO: Colorado State University. 66 p.
- Korb N.T.; Bauer, B.D.; Keigley, R.B. 2008. Centennial Valley aspen assessment: evaluating stand structure and effects of herbivory. On file at the Nature Conservancy, Helena, MT.
- Korschgen, C.E.; George, L.S.; Green, W.L. 1985. Disturbance of diving ducks by boaters on a migrational staging area. *Wildlife Society Bulletin* 13:290–296.
- Krull, J.N. 1970. Aquatic plant-macroinvertebrate associations and waterfowl. *Journal of Wildlife Management* 34:707–718.
- Kruse, T.E. 1959. Grayling of Grebe Lake, Yellowstone National Park, Wyoming. *Fishery Bulletin* 149. Washington DC: U.S. Fish and Wildlife Service. 44 p.
- Lancia, R.A.; Braun, C.E.; Collopy, M.W.; Dueser, R.D.; Kie, J.G.; Martinka, C.J.; Nichols, J.D.; Nudds, T.D.; Porath, W.R.; Tilghman, N.G. 1996. ARM! For the future: adaptive resource management in the wildlife profession. *Wildlife Society Bulletin* 24:436–442.
- Lanphere, M.A.; Champion, D.E.; Christiansen, R.L.; Izett, G.A.; Obradovich, J.D. 2002. Revised ages of tuffs of Yellowstone Plateau volcanic field: Assignment of the Huckleberry Ridge Tuff to a new geomagnetic polarity event. *Geological Society of American Bulletin* 14:559–568.
- Leach, G. 1941. Comments from the Service Division of Fish Culture on stocking Red Rock Creek. Letter addressed to Fred Foster, U.S. Fish and Wildlife Service Assistant Regional Director, 15 July 1941. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- Leonard, J.W. 1939. Feeding habits of the Montana grayling (*Thymallus montanus Milner*) in Ford Lake, Michigan: Proceedings, [Name of proceedings unknown]; [Date of proceedings unknown]; [Place of proceedings unknown]. In: *Transactions of the American Fisheries Society* 68:188–195.
- Lesica, P.; Cooper, S.V. 1997. Presettlement vegetation of southern Beaverhead County, Montana. On file at Montana Natural Heritage Program, Helena, MT.
- Lesica, P.; Cooper, S.V. 1999. Succession and disturbance in sandhills vegetation: constructing models for managing biological diversity. *Conservation Biology* 13:293–302.
- Lesica, P.; Cooper, S.V.; Kudray, G. 2005. Big sagebrush shrub-steppe postfire succession in southwest Montana. On file at Montana Natural Heritage Program, Helena, MT.
- Lowther, P.E. 2000. Pacific-slope flycatcher (*Empidonax difficilis*) and Cordilleran flycatcher (*Empidonax occidentalis*). In: Poole, A.; Gill, F., editors. *The birds of North America* 556. Ithaca NY: Cornell Laboratory of Ornithology. [Internet]. *Birds of North America Online*. <<http://bna.birds.cornell.edu/bna/species/556a>> accessed May 2008.
- Lowther, P.E.; Celada, C.; Klein, N.K.; Rimmer, C.C.; Spector, D.A. 1999. Yellow warbler (*Dendroica petechia*). In: Poole, A., editor. *The birds of North America online*. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. *Birds of North America Online*. <http://bna.birds.cornell.edu/BNA/account/Yellow_Warbler/> [Access date unknown].
- Lund, J.A. 1974. The reproduction of salmonids in the inlets of Elk Lake, Montana. [master's thesis]. Bozeman, MT: Montana State University. [Pages unknown].

- Madsen J. 1985. Impact of disturbance on field utilization of pink-footed geese in West Jutland, Denmark. *Biological Conservation* 33:53–63.
- Madsen J. 1995. Impacts of disturbance on migratory waterfowl. *Ibis* 137:567–574.
- Martin, K.; Aitken, K.E.H.; Wiebe, K.L. 2004. Nest sites and nest webs for cavity-nesting communities in interior British Columbia, Canada: nest characteristics and niche partitioning. *Condor* 106:5–19.
- McEachern, P.; Prepas, E.E.; Gibson, J.J.; Dinsmore, W.P. 2000. Forest fire induced impacts on phosphorous, nitrogen, and chlorophyll A in boreal subarctic lakes of northern Alberta. *Canadian Journal of Fisheries and Aquatic Sciences* 57:73–81.
- Merrill, T.; Mattson, D.J. 2003. The extent and location of habitat biophysically suitable for grizzly bears in the Yellowstone region. *Ursus* 14:171–187.
- Mitchell, C.D. 1994. Trumpeter swan (*Cygnus buccinator*). In: Poole, A.; Gill, F., editors. *The birds of North America* 105. Ithaca NY: Cornell Laboratory of Ornithology. [Internet]. *Birds of North America Online*. <<http://bna.birds.cornell.edu/bna/species/105>> accessed May 2008.
- Mitsch, W.J.; Gosselink, J.G. 1986. *Wetlands*. New York: Van Nostrand Reinhold. 539 p.
- Mogan, J. 1996. Status and biology of the spawning population of Red Rock Lakes' Arctic grayling. [master's thesis]. Bozeman, MT: Montana State University. 90 p.
- . 1996. *Montana Field Guide: Montana*. [Internet]. Revised March 23, 2009. <http://fieldguide.mt.gov/detail_AFCHA07010.aspx> accessed 23 March 2007.
- [MFWP] Montana Fish, Wildlife and Parks. 1995. *Montana fluvial Arctic grayling restoration plan*. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- . 1996. *The population of Arctic grayling in Upper Red Rock Lake*. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- . 2004. *Montana statewide elk management plan*. Helena, MT: Wildlife Division, Montana Fish, Wildlife and Parks. 397 p.
- . 2005. *The Montana comprehensive fish and wildlife conservation strategy*. On file at Montana Fish, Wildlife and Parks, Helena, MT.
- [MTNHP] Montana Natural Heritage Program. 2002. *2002 list of ecological communities for Montana*. On file at Montana State Library, Helena, MT.
- [MTNHP and MFWP] Montana Natural Heritage Program and Montana Fish, Wildlife and Parks. 2006. *Montana animal species of concern*. Helena, MT: Montana Natural Heritage Program and Montana Fish, Wildlife and Parks. 17 p.
- Morris, M.S.; Kelsey, R.G.; Griggs, D. 1976. The geographic and ecological distribution of big sagebrush and other wood Artemisias in Montana. In: *Proceedings of the Montana Academy of Science*. [Date of proceedings unknown]; [Place of proceedings unknown]: Proceedings of the Montana Academy of Sciences. 36:56–79.
- Morton, J.M. 1995. Management of human disturbance and its effects on waterfowl. In: Whitman, W.R.; Strange, T.; Widjeskog, L.; Whitemore, R.; Kehoe, P.; Roberts, L., editors. *Waterfowl habitat restoration, enhancement and management in the Atlantic Flyway*. 3rd ed. Dover, DE: Environmental Management Committee, Atlantic Flyway Council Technical Section, and Delaware Division of Fish and Wildlife. F59–F86.
- Morton, J.M.; Fowler, A.C.; Kirkpattick, R.L. 1989a. Time and energy budgets of American black ducks in winter. *Journal of Wildlife Management* 53(2):401–410.
- Morton, J.M.; Kirkpattick, R.L.; Vaughan, M.R.; Stauffer, D.F. 1989b. Habitat use and movements of American black ducks in winter. *Journal of Wildlife Management* 53:390–400.
- Mueggler, W.F.; Stewart, W.L. 1980. *Grassland and shrubland habitat types of western Montana*. General Technical Report INT-66. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 154 p.
- Muenschler, W.C. 1936. The germination of seeds of Potamogeton. *Annals of Botany* 50:805–821.
- Muller, M.J.; Storer, R.W. 1999. Pied-billed grebe (*Podilymbus podiceps*). In: Poole, A.; Gill, F., editors. *The birds of North America* 410. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. *Birds of North America Online*. <<http://bna.birds.cornell.edu/bna/species/410>> accessed May 2008.
- Mullins, W.H.; Bizeau, E.G. 1978. Summer Foods of Sandhill Cranes in Idaho. *Auk* 95(1):75–178.
- Murkin, H.R.; Kadlec, J.A. 1986. Relationships between waterfowl and macroinvertebrate densities in a northern prairie marsh. *Journal of Wildlife Management* 50:212–217.
- Murkin, H.R.; Murkin, E.J.; Ball, J.P. 1997. Avian habitat selection and prairie wetland dynamics: a 10-year experiment. *Ecological Applications* 7:1144–1159.

- Nelson, P.H. 1954. Life history and management of the American grayling (*Thymallus signifer tricolor*) in Montana. *Journal of Wildlife Management* 18:324–342.
- Newlon, K. R. 2007. Red Rock Lakes National Wildlife Refuge vegetation mapping project. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- Nielson, E.C.; Farnsworth, D.N. 1965. Soil survey handbook for Red Rock Lakes Migratory Waterfowl Refuge in survey area 061. Soil Conservation Service, Dillon Field Office. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- O'Neill, J.M.; Christiansen, R.L. 2004. Geologic map of the Hebgen Lake Teton Counties, Wyoming, and Clark and Fremont Counties, Idaho. U.S. Geological Survey Scientific Investigations Map 2816. [Place of publication unknown]: U.S. Geological Survey. [Pages unknown].
- O'Reilly, M. 2006. Relationships among moose abundance, willow community structure, and migratory landbirds at Red Rock Lakes National Wildlife Refuge. [bachelor of science thesis]. Bozeman, MT: Montana State University. 32 p.
- Oring, L.W.; Neel, L.; Oring, K.E. 2000. Intermountain West regional shorebird plan. Version 1.0. [Place of publication unknown]: [Publisher unknown]. 55 p.
- Owens, N.W. 1977. Responses of wintering brant geese to human disturbance. *Wildfowl* 28:5–14.
- Pampush, G.J.; Anthony, R.G. 1993. Nest success, habitat utilization and nest-site selection of long-billed curlews in the Columbia Basin, Oregon. *Condor* 95:957–967.
- Paulins S.L. 1984. Activity budgets of nonbreeding gadwalls in Louisiana. *Journal of Wildlife Management* 48:371–380.
- Paullin, D.G. 1973. The ecology of submerged aquatic macrophytes of Red Rock Lakes National Wildlife Refuge, Montana. [master's thesis]. Missoula, MT: University of Montana. 171 p.
- Payne, N.F. 1992. Techniques for wildlife habitat management of wetlands. New York: McGraw-Hill. 549 p.
- Pettit, N.E.; Naiman, R.J. 2007. Fire in the riparian zone: characteristics and ecological consequences. *Ecosystems* 10(5):673.
- Poole, K. G.; Stuart-Smith, K. 2004. Winter habitat selection by moose in the East Kootenay, British Columbia, final report. Aurora Wildlife Research, Nelson, British Columbia, Canada. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- Ratti, J. T.; Kadlec, J. A. 1992. Intermountain West waterfowl-wetland concept plan. Portland, OR: U.S. Fish and Wildlife Service, Office of Migratory Bird Management. 150 p.
- Rauscher, R.L. 1997. Status and distribution of the pygmy rabbit in Montana: final report. Bozeman, MT: Montana Department of Fish, Wildlife and Parks. 27 p.
- Raveling, D.G. 1979. The annual cycle of body composition of Canada geese with special reference to control of reproduction. *The Auk* 96:234–252.
- Redenbach, Z.; Taylor, E.B. 1999. Zoogeographical implications of variation in mitochondrial DNA of Arctic grayling (*Thymallus arcticus*). *Molecular Ecology* 8:23–35.
- Reiss, S.A. 1995. Sport in industrial America, 1850–1920. The American History Series. Wheeling, IL: Harlan Davidson, Inc. 178 p.
- Restani, M. 1991. Resource partitioning among three buteo species in the Centennial Valley, Montana. *Condor* 93:1007–1010.
- Rich, T.D.; Beardmore, C.J.; Berlanga, H.; Blancher, P.J.; Bradstreet, M.S.W.; Butcher, G.S.; Demarest, D.W.; Dunn, E.H.; Hunter, W.C.; Inigo-Elias, E.E.; Kennedy, J.A.; Martell, A.M.; Panjabi, A.O.; Pashley, D.N.; Rosenberg, K.V.; Rustay, C.M.; Wendt, J.S.; Will, T.C. 2004. Partners in Flight North American landbird conservation plan. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. Revised March 2005. <http://www.partnersinflight.org/cont_plan/> accessed 1 April 2009.
- Ricklefs, R. E. 1977. On the evolution of reproductive strategies in birds: reproductive effort. *American Naturalist* 111:453–478.
- Ritchie, B. W. 1978. Ecology of moose in Fremont County, Idaho. *Wildlife Bulletin No. 7*. Boise, ID: Idaho Department of Fish and Game. 32 p.
- Romme, W.H.; Turner, M.G.; Wallace, L.L.; Walker, J.S. 1995. Aspen, elk, and fire in northern Yellowstone Park. *Ecology* 76:2097–2106.
- Rotenberry, J.T.; Patten, M.A.; Preston, K.L. 1999. Brewer's sparrow (*Spizella breweri*). In: Poole, A.; Gill, F., editors. *The birds of North America* 390. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. *Birds of North America Online*. <<http://bna.birds.cornell.edu/bna/species/390>> accessed May 2008.
- Rowland, M.M. 2004. Effects of management practices on grassland birds: greater sage-grouse. [Internet]. Revised August 12, 2004. Northern Prairie Wildlife Research Center Online. <<http://>

- www.npwrc.usgs.gov/resource/literatr/grasbird/grsg/grsg.htm> [Access date unknown].
- Rudzitis G. 1996. Wilderness and the changing American west. New York: Wiley. 240 p.
- Rusch, D.H.; DeStefano, S.; Reynolds, M.C.; Lauten, D. 2000. Ruffed grouse (*Bonasa umbellus*). In: Poole, A.; Gill, F., editors. The birds of North America 515. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. Birds of North America Online. <<http://bna.birds.cornell.edu/bna/species/515>> accessed May 2008.
- Russell, O.; Haines, A.L. 1965. Osborne Russell's journal of a trapper. Lincoln, NE: University of Nebraska Press. 191 p.
- Sankey, T.T.; Montagne, C.; Graumlich, L.; Lawrence, R.; Nielsen, J. 2006. Twentieth century forest—grassland ecotone shift in Montana under differing livestock grazing pressure. *Forest Ecology and Management* 234:282–292.
- Schladweiler, P. 1974. Ecology of Shiras moose in Montana. On file at Montana Fish, Wildlife and Parks, Helena, MT.
- Schmutz, J. A.; Rockwell, R. F.; Peterson, M. R. 1997. Relative effects of survival and reproduction on the population dynamics of emperor geese. *Journal of Wildlife Management* 61:191–201.
- Schoennagel, T.; Veblen, T.T.; Romme, W.H. 2004. The interaction of fire, fuels, and climate across Rocky Mountain Forests. *Bioscience* 54:661–676.
- Schroeder, M.A.; Young, J.R.; Braun, C.E. 1999. Greater sage-grouse (*Centrocercus urophasianus*). In: Poole, A.; Gill, F., editors. The birds of North America 425. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. Birds of North America Online. <<http://bna.birds.cornell.edu/bna/species/425>> accessed May 2008.
- Sears, J.W.; Fritz, W.J. 1998. Cenozoic tilt domains in southwestern Montana: interference among three generations of extensional fault systems. In: Faulds, J.E.; Stewart, J.H., editors. Accommodation zones and transfer zones: the regional segmentation of the Basin and Range province. Special Paper 323. [Place of publication unknown]: Geological Society of America. 241–247.
- Sedgwick, J.A. 1993. Dusky flycatcher (*Empidonax oberholseri*). In: Poole, A.; Gill, F., editors. The birds of North America 78. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. Birds of North America Online. <<http://bna.birds.cornell.edu/bna/species/078>> accessed May 2008.
- Sempeski, P.; Gaudin, P. 1995. Habitat selection by grayling—I. Spawning habitats. *Journal of Fish Biology* 47:256–265.
- Servheen, C.; Sandstrom, P. 1993. Ecosystem management and linkage zones for grizzly bears and other large carnivores in the northern Rocky Mountains in Montana and Idaho. *Endangered Species Technical Bulletin* 18:3. Washington, DC: U.S. Fish and Wildlife Service. 8–13.
- Sharp, W.M. 1951. Environmental requirements of a freshwater marsh and the ecology of some aquatic plants. In: Proceedings, 1951 Northeast Game Conference; 23 February 1951; [Place of proceedings unknown]. [Place of publication unknown]: Proceedings of the Northeast Game Conference. 6 p.
- Sive, B.; Shively, D.; Pape, B. 2003. Spatial variation of volatile organic compounds associated with snowmobile emissions in Yellowstone National Park. Report to the National Park Service, 2003. On file at University of New Hampshire Climate Change Research Center, Durham, NH.
- Sonderegger, J.L.; Schofield, J.D.; Berg, R.B.; Mannick, M.W.; Weinheimer, G.W. 1982. The Upper Centennial Valley, Beaverhead and Madison counties, Montana: An investigation of resources utilizing geology, geological, geophysical, hydrochemical, and geothermal methods. Memoir 50. Montana Bureau of Mines and Geology. [Place of publication unknown]. 53 p.
- Sperry, C.C. 1922. Report on the Red Rock Lake District east of Monida (Beaverhead County) Montana, with recommendations for its improvement as a wild duck feeding ground. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- Squires, J.R.; Anderson, S.H. 1995. Trumpeter swan (*Cygnus buccinator*) food habits in the Greater Yellowstone Ecosystem. *American Midland Naturalist* 133:274–282.
- Subcommittee on Rocky Mountain Trumpeter Swans. 2008. Pacific Flyway management plan for the Rocky Mountain population of trumpeter swans. Pacific Flyway Study Committee. [Internet]. Revised July 2008. <<http://www.pacificflyway.gov/Abstracts.asp#rmts>> [Access date unknown].
- Stacy, M.D.; Perryman, B.L.; Stahl, P.D.; Smith, M.A. 2005. Brome control and microbial inoculation effects in reclaimed cool-season grasslands. *Rangeland Ecology and Management* 58:161–166.
- Stevens, D. R. 1970. Winter ecology of moose in the Gallatin Mountains, Montana. *Journal of Wildlife Management* 34:37–46.
- Stewart, R.E.; Kantrud, H.A. 1973. Ecological distribution of breeding waterfowl populations in North Dakota. *Journal of Wildlife Management* 37:39–50.

- Storer, R.W.; Nuechterlein, G.L. 1992. Western and Clark's grebe. In: Poole, A.; Stettenheim, P.; Gill, F., editors. The birds of North America 26. Ithaca, NY: Cornell Laboratory of Ornithology. [Internet]. Birds of North America Online. <<http://bna.birds.cornell.edu/bna/species/026a>> accessed May 2008.
- Summer R.M. 1980. Impacts of horse traffic on trails in Rocky Mountain National Park. *Journal of Soil and Water Conservation* 35(2):85–87.
- Svejcar, T.; Riegel, G.M. 1998. Spatial pattern of gas exchange for montane moist meadow species. *Journal of Vegetation Science* 9:85–94.
- Tacha, T.C.; Nesbit, S.A.; Vohs, P.A. 1992. Sandhill crane (*Grus canadensis*). In: Poole, A.; Stettenheim, P.; Gill, F., editors. The birds of North America 31. Ithaca, NY: Cornell Laboratory of Ornithology. Birds of North America Online. [Internet]. <<http://bna.birds.cornell.edu/bna/species/031>> accessed May 2008.
- Taylor, J.F. 1991. Report on cultural resources inventory of four proposed project locations within the Red Rock Lakes National Wildlife Refuge. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- Thines, N.J.; Shipley, L.A.; Saylor, R.D. 2004. Effects of cattle grazing on ecology and habitat of Columbia Basin pygmy rabbits (*Brachylagus idahoensis*). *Biological Conservation* 119:525–534.
- Thomas, R.C.; Sears, J.W.; Fritz, W.J.; Landon, S.C. 2000. Cenozoic extensional history of southwest Montana. *Geological Society of America*. 32:A–40.
- Thomas, V.G. 1982. Spring migration: the prelude to goose reproduction and a review of its implication. In: Boyd, H., editor. Fourth Western Hemisphere waterfowl and waterbird symposium: Proceedings of the International Waterfowl Research Bureau Symposium; 1983; Ottawa, ON, Canada: Canadian Wildlife Service. Special Publication. 73–81.
- Tirmenstein, D. 1999. *Artemisia tridentata* spp. *tridentata*. In: Fire Effects Information System, [Internet]. Revised July 8, 2007. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. <<http://www.fs.fed.us/database/feis/>> [Access date unknown].
- Turchi, G.M.; Kennedy, P.L.; Urban, D.; Hein, D. 1995. Bird species richness in relation to isolation of aspen patches. *Wilson Bulletin* 107:463–474.
- Unthank, A. 1989. Historical overview of Red Rock Lakes National Wildlife Refuge grayling. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT. [Pages unknown].
- U.S. Census Bureau. 1999. Census Bureau: State and County QuickFacts for Montana. Data derived from 1999 Population Estimates. [Internet]. [Revision date unknown]. <<http://quickfacts.census.gov>> accessed June 2007.
- [USFWS] U.S. Fish and Wildlife Service. 1974–1975. Red Rock Lakes National Wildlife Refuge annual narrative 1974–1975. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- . 1978. Red Rock Lakes National Wilderness, an aquatic history, 1889–1977. On file at Kalispell Field Station, U.S. Fish and Wildlife Service. Creston, MT.
- . 1992. Environmental assessment for proposed termination of winter feeding of trumpeter swans at Red Rock Lakes National Wildlife Refuge. Lakewood, CO: Mountain-Prairie Region, U.S. Fish and Wildlife Service. 26 p.
- . 1994. Upland habitat management plan. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- . 1994–1995. Red Rock Lakes National Wildlife Refuge annual narrative 1994–1995. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- . 1997. A system for mapping riparian areas in the western United States. Arlington, VA: National Wetlands Inventory. 15 p.
- . 1999a. National Wetlands inventory website: U.S. Department of the Interior, Fish and Wildlife Service. [Internet]. [Revision date unknown]. <<http://www.fws.gov/nwi/>> accessed May 2007.
- . 1999b. Fulfilling the promise, the National Wildlife Refuge System. Arlington, VA: U.S. Department of the Interior, U.S. Fish and Wildlife Service. 101 p.
- . 2001. Centennial Valley Conservation Easement Program Plan. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- . 2002a. Fisheries program, a vision for the future. [Internet]. [Revision date unknown]. <<http://www.fws.gov/fisheries/CAF/Vision.htm#intro>> accessed 23 January 2008.
- . 2002b. Birds of conservation concern 2002. Arlington, VA: Division of Migratory Bird Management. 99 p.
- . 2004. Adaptive resource management plan for Lower Red Rock Lake, Red Rock Lakes National Wildlife Refuge. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- . 2005. The migratory bird program's focal species strategy: measuring success in achieving

- our existing bird conservation priorities and mandates. Arlington, VA: Division of Migratory Bird Management. 2 p.
- . 2008a. Moose winter survey data, 1966–2008. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- . 2008b. Midwinter waterfowl survey. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- . 2008c. Submerged aquatic vegetation surveys 2003–2008. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- U.S. Fish and Wildlife Service and Canadian Wildlife Service. 1986. North American waterfowl management plan: a strategy for cooperation. Washington, DC: U.S. Fish and Wildlife Service and Ottawa, Ontario: Canadian Wildlife Service. 19 p.
- [USGS]. United States Geological Survey. 2006. Classification of wetlands and deepwater habitats of the United States; emergent wetland. [Internet]. [Revision date unknown]. <<http://www.npwrc.usgs.gov/resource/wetlands/classwet/emergent.htm>> accessed 23 March 2009.
- Vander Haegen, W.M.; Dobler, F.C.; Pierce, J.D. 2000. Shrubsteppe bird response to habitat and landscape variables in eastern Washington, U.S.A. *Conservation Biology* 14:1145–1160.
- Vander Haegen, W.M.; Schroeder, M.A.; DeGraaf, R.M. 2002. Predation on real and artificial nests in shrubsteppe landscapes fragmented by agriculture. *Condor* 101:496–506.
- Vincent, R.E. 1962. Biogeographical and ecological factors contributing to the decline of Arctic grayling, *Thymallus arcticus Pallas*, in Michigan and Montana. [PhD dissertation]. Ann Arbor, MI: University of Michigan. 169 p.
- Voigts, D.K. 1976. Aquatic invertebrate abundance in relation to changing marsh vegetation. *American Midland Naturalist* 95:313–322.
- Walker, B. 2004. Effects of management practices on grassland birds: Brewer's sparrow. [Internet]. Revised 12 August 2004. Northern Prairie Wildlife Research Center Online. <<http://www.npwrc.usgs.gov/resource/literatr/grasbird/brsp/brsp.htm>> accessed July 2007.
- Walker, R.; Craighead, L. 1997. Analyzing wildlife movement corridors in Montana using GIS. In: Proceedings, 1997 ESRI International User Conference; 1997 July 8–11; San Diego, CA. San Diego, CA: Proceedings of the 1997 ESRI International User Conference. [Internet]. ESRI. Revised 1997. <<http://proceedings.esri.com/library/userconf/proc97/proc97/to150/pap116/p116.htm>> [Access date unknown].
- Wallestad, R.O.; Pyrah, D.B. 1974. Movement and nesting of sage grouse hens in central Montana. *Journal of Wildlife Management* 38:630–633.
- Walters, C.J.; Holling, C.S. 1990. Large-scale management experiments and learning by doing. *Ecology* 71:2060–2068.
- Warren, J.M.; O'Reilly, M. 2005. Hunting district 334 winter moose survey data analysis. On file at Red Rock Lakes National Wildlife Refuge, Lima, MT.
- Welch, B.L.; Criddle, C. 2003. Countering misinformation concerning big sagebrush. Research Paper RMRS-RP-40. Ogden, UT: United States Department of Agriculture, Forest Service. 28 p.
- Weller, M.W. 1981. Freshwater marshes: ecology and wildlife management. Minneapolis, MN: University of Minnesota Press. 146 p.
- . 1999. Wetland birds. Cambridge, UK: Cambridge University Press. 271 p.
- Weller, M. W.; Fredrickson, L. H. 1973. Avian ecology of a managed glacial marsh. *Living Bird* 12:269–291.
- Weller, M.W.; Spatcher, C.E. 1965. Role of habitat in the distribution and abundance of marsh birds. Department of Zoology and Entomology Special Report 43. Ames, IA: Agricultural and Home Economics Experiment Station, Iowa State University. 30 p.
- White-Robinson, R. 1982. Inland and salt marsh feeding of winter brant geese in Essex. *Wildfowl* 33:113–118.
- Wiggins, D.A.; Holt, D.W.; Leasure, S.M. 2006. Short-eared owl (*Asio flammeus*). In: Poole, A., editor. The birds of North America online. Ithaca, NY: Cornell Laboratory of Ornithology. <http://bna.birds.cornell.edu/BNA/account/Yellow_Warbler/> accessed August 2007.
- Williams B.; Conway-Durver, L. 1998. Horse trails in ecological reserves. In: Proceedings, Clemson University Horse Trails Symposium. 1998 October 18–21; Clemson University, Clemson, SC. On file at Clemson University, Clemson, SC.
- Willson, G.D.; Stubbendieck, J. 1996. Suppression of smooth brome by atrazine, mowing, and fire. *The Prairie Naturalist* 28:13–20.
- . 1997. Fire effects on four growth stages of smooth brome (*Bromus inermis Leyss*). *Natural Areas Journal* 17:306–312.

- . 2000. A provisional model for smooth management in degraded tallgrass prairie. *Ecological Restoration* 18:34–38.
- Windell, J.T.; Willard, B.E.; Cooper, D.J.; Foster, S.Q.; Knud-Hansen, C.F.; Rink, L.P.; Kiladis, G.N. 1986. An ecological characterization of Rocky Mountain montane and subalpine wetlands. U.S. Fish and Wildlife Service Biology Report 86(11). 298 p.
- Winternitz, B.L. 1980. Birds in aspen. In: Workshop proceedings: management of western forests and grasslands for nongame birds: Proceedings of the workshop; 1980 February 11–14; Salt Lake City UT. Ogden, UT: U.S. Department of Agriculture, Forest Service. INT-GTR-86. 247–257.
- Wirth T.; Maus, P.; Powell, J.; Lachowski, H. 1996. Monitoring aspen decline using remote sensing and GIS: Gravelly Mountain Landscape, southwestern Montana. Salt Lake City, UT: Remote Sensing Steering Committee, U.S. Department of Agriculture, Forest Service. [Pages unknown].
- Wolder, M. 1993. Disturbance of wintering northern pintails at Sacramento National Wildlife Refuge, California. [master's thesis]. Arcata, CA: Humboldt State University. 62 p.
- Wood, A.K. 1993. Parallels between old-growth forest and wildlife population management. *Wildlife Society Bulletin* 21:91–95.
- Wright, H.A.; Klemmedson, J.O. 1965. Effect of fire on bunchgrasses of the sagebrush-grass region of southern Idaho. *Ecology* 46:680–688.
- Zimmer, K.D.; Hanson, M.A.; Butler, M.G. 2000. Factors influencing invertebrate communities in prairie wetlands: a multivariate approach. *Canadian Journal of Fisheries and Aquatic Sciences* 57:76–85.
- Zlatnik, E. 1999. *Hesperostipa comata*. In: Fire Effects Information System, [Internet]. Revised 6 July 2007. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. <<http://www.fs.fed.us/database/feis/>> [Access date unknown].
- Zouhar, K.L. 2000. *Festuca idahoensis*. In: Fire Effects Information System, [Internet]. Revised 29 June 2007. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory. <<http://www.fs.fed.us/database/feis/>> [Access date unknown].

